The Refrigeration Service Engineer

VOL. 14 NO. 12 ★ ★ ★ DECEMBER · 1946

TECHNOLOGY DEPT.
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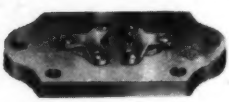
JAN 1947
DETROIT

The Records Show . . . .

OUR PROFITS THIS YEAR WERE HIGHER - OUR SERVICE WAS BETTER - BECAUSE WE USED

CHICAGO SEALS AND VALVE PLATES



CHICAGO VALVE PLATES

Save time and work, too. Only refrigerator compressor valve plates with removable valve seats. Sizes for most compressors.

CHICACO GENERAL REPLACEMENT SEALS

Go on refrigerator compressors in less time, with less work, and cut down "call backs."

MODERN DESIGN

SOLD BY JOBBERS

CHICAGO SEAL CO.

20 NORTH WACKER DRIVE • CHICAGO 6, ILL.

THE REFRIGERATION SERVICE ENGINEER, Nickerson & Collins Co., Publishers, 433 N. Waller Ave., Chicago 44, Ill. Published monthly, Vol. 14, No. 12, December, 1946. Entered as second class matter March 4, 1938, Chicago, Ill., under the Act of March 3, 1879. Subscription in the United States, $2.00 per year; all other countries, $3.00 per year.

The Ansul Research Staff REPORTS ON . . . . .

WAX IN OIL-REFRIGERANT MIXTURES

WAX CAUSES FROZEN VALVES *too!*

These photographs show the results of practical machine tests in which 10% oil was circulated with the refrigerant. Valve temperature was approximately −25 degrees Fahrenheit. Every effort was made to exclude moisture. Within a few hours wax separated throughout the body of the expansion valve and the forepart of the expansion coil adhering firmly to the metal.

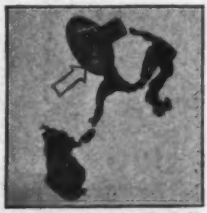
* Ansul Wholesalers are ready and equipped to render an intelligent, co-operative service to refrigeration engineers and maintenance men on problems which arise from time-to-time in the operation of refrigerating systems.

FOR EXAMPLE:

Samples of ice machine oils submitted by users of Ansul Refrigerants to Ansul Wholesalers, are tested by Ansul laboratories without charge by the Ansul Standard Wax-Oil Separation Method. This approved method, developed and standardized especially for use in connection with oils used in refrigerating systems, provides an accurate determination of the amount of wax which separates from an oil at low temperatures.

*REG. U. S. PAT. OFF.

A wax deposit, about 1/8 inch thick, formed on the plate carrying the ball-valve enclosure and almost completely clogged the outlet of the expansion valve.



Wax deposited on the ball-valve closure plate

REMEDIES

To eliminate wax trouble in expansion valves and coils:

*

1. Use an oil which separates little or no wax from its mixture with the refrigerant at the operating temperature of the valve.

2. Install an oil trap to cut down the amount of oil (and consequent wax) circulating with the refrigerant.

Wax deposited in outlet of expansion valve

SEND FOR THIS BULLETIN

An informative reprint, "THE SEPARATION OF WAX FROM OIL-REFRIGERANT MIXTURES," will be sent on request. No obligation. Just address . . .

Ansul refrigerants are available at leading wholesalers everywhere

ANSUL CHEMICAL COMPANY

REFRIGERATION DIVISION, MARINETTE, WISCONSIN

DISTRIBUTORS FOR KINETIC'S FREON-11, FREON-12, FREON-21, FREON-22 AND FREON-113

"DETROIT"

COMPLETE LINE OF EXPANSION VALVES

PREFERRED BY REFRIGERATION MEN EVERYWHERE

Preference of refrigeration men for "Detroit" Valves is based on a long record of excellent performance. The industry knows "Detroit" Valves will do a better job—keep right on doing it over years of service.

Illustrated and described here are representative members of the complete line. There is a "Detroit" Valve for every refrigeration need from extremely low temperatures to air conditioning temperatures.

NO. 673 THERMOSTATIC EXPANSION VALVE

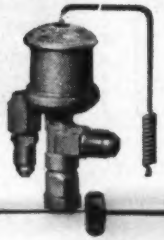
For many years the standard of the industry. Gas charged—keeps evaporators completely refrigerated. Orifice sizes 3/64" to 7/32" with capacities up to 3½ tons Freon-12 or Sulphur, and 6 tons Methyl.

UNIT NUMBERS OF STANDARD NO. 673 VALVES

No.	Refrigerant and Operating Pressure	Orifice	Capacity
6731968	Freon-12—15 lb.	3/64"	1.0 tons
6731428	Freon-12—85 lb.	3/64"	1.0 tons
6731563	Methyl—10 lb.	3/64"	2.0 tons
6731411	Methyl—40 lb.	3/64"	2.0 tons

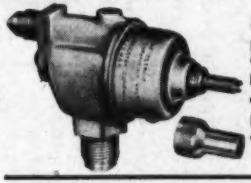
Inlets for above—⅜" S.A.E. for ⅜" x ¼" Reducing Nut. Outlets—½" S.A.E.

Valves of other specifications are available.



NO. 573 THERMOSTATIC EXPANSION VALVE

This valve, in ½-ton (Freon-12) capacity, has the quality and operating characteristics of the No. 673. Designed for small commercial installations, its double diaphragm construction makes possible close superheat control at low suction pressures. The two-diaphragm area-balanced action in its simplest, most effective form, using only one efficient power element.



NO. 672 AUTOMATIC EXPANSION VALVE

Pressure ranges 25" vacuum to 25 pounds pressure, or 0 to 50 pounds pressure. Orifices 1/32", 3/64", 5/32", and 7/32". Unit Number of Standard No. 672 Valve (3/64" orifice, range 25" vacuum to 25 lbs. pressure)—No. 672451. Other sizes available.

NO. 787 LARGE CAPACITY THERMOSTATIC VALVES

Special alloy diaphragms give reliable and uniform operation—Delubaloy needles and seats, exceptionally durable and corrosion resistant, high side liquid precooled by means of integral heat exchanger. Unit number of Standard No. 787 Valve (capacity 6-11 tons Freon-12)—No. 78711. Other sizes available. Supplied with external equalizer.

NO. 899

Standard No. 787 Valve (capacity 8-11 tons Freon-12)—No. 78711. Other sizes available. Supplied with external equalizer.

tion in its simplest, most effective form, using only one efficient power element.

UNIT NUMBERS OF STANDARD NO. 573 VALVES

No.	Refrigerant and Operating Pressure	Capacity
57300	Freon-12—45 lb.	.5 ton
57309	Freon-12—10 lb.	.5 ton
57311	Methyl—35 lb.	.9 ton
57315	Methyl—5 lb.	.9 ton

Inlet—⅜" S.A.E. for ⅜" x ¼" Reducing Nut. Outlet—½" S.A.E. for ½" x ⅜" Reducing Nut.

NO. 899 THERMOSTATIC EXPANSION VALVE

For commercial installations. Furnished with or without external equalizer and has forged union connections. Capacity 1.5 to 6 tons Freon-12 or Sulphur—3 to 11 tons Methyl.

NO. 893 THERMOSTATIC EXPANSION VALVE

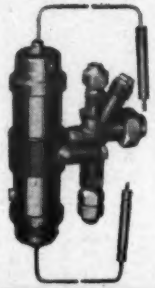
Rated at ½ ton Freon-12 and Sulphur, .9 ton Methyl. Inlet ¼" or ⅜" S.A.E. Outlet ¼" female, MPT; ⅜" or ½" S.A.E. Regularly supplied with strainer at inlet.

UNIT NUMBERS OF STANDARD NO. 893 VALVES

No.	Refrigerant and Operating Pressure	Orifice	Capacity
89335	Freon-12—15 lb.	1/16"	.5 tons
89330	Freon-12—55 lb.	1/16"	.5 tons
89333	Methyl—10 lb.	1/16"	1.0 tons
89329	Methyl—40 lb.	1/16"	1.0 tons

Inlets for above—4' S.A.E. Outlets—½' S.A.E.

Valves of other specifications are available.



NO. 793 DIFFERENTIAL TEMPERATURE EXPANSION VALVE—FOR OPERATION BELOW MINUS 30 DEG F

An entirely new design, it gives complete satisfaction on those difficult sub-zero jobs.

2188

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Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

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"DETROIT"

"Detroit" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators

REDUCE YOUR OPERATING COSTS WITH THE "LITTLE GIANT" PURGER

The "Little Giant" Purger is an essential item and a profitable investment that quickly pays for itself because:

It reduces power costs
It saves expensive refrigerant
It reduces wear and tear on equipment

It is particularly important that any refrigeration system be purged after a shut-down period of any considerable time. The usual practice is to pump the refrigerant back into the receiver and lock it in by means of valves. Repairs or alterations are made on the system during this time, and it is practically impossible to evacuate the system completely, with the result that the remaining air will cause excessive head pressures.

There is no guesswork when you have the "Little Giant" Purger on the job. The sight glass gives visible evidence of non-condensable gases in the system. There is no loss of refrigerant. It is simple to operate and the reduction in power costs will pay for it many times over. Write us for full particulars and instructions for installation and operation.

MUELLER BRASS CO.
PORT HURON, MICHIGAN

Westinghouse Electric Corporation

USES MUELLER BRASS CO. PARTS IN THEIR WATER COOLERS AND OTHER REFRIGERATION UNITS

With the complete line of Westinghouse Water Coolers, you can meet the requirements of all your customers. For Westinghouse builds bottle coolers, standard coolers and explosion-proof coolers—models for all kinds and types of applications... from the small office to the busy store or factory. They are designed with an eye to your merchandising problems ... making easier your sales, installation and service.

Westinghouse Water Coolers are practical, efficient, low-cost equipment which will satisfy the buyer and lead to more sales.

These units are powered by the famous Westinghouse hermetically-sealed refrigeration unit ... completely sealed against dirt and moisture. Years of research and development by Westinghouse engineers assure your customers a long period of economical, trouble-free service.

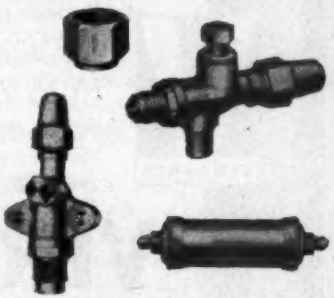
THESE PRODUCTS MUST BE GOOD!

BUILT-IN QUALITY
TIME-TESTED PERFORMANCE

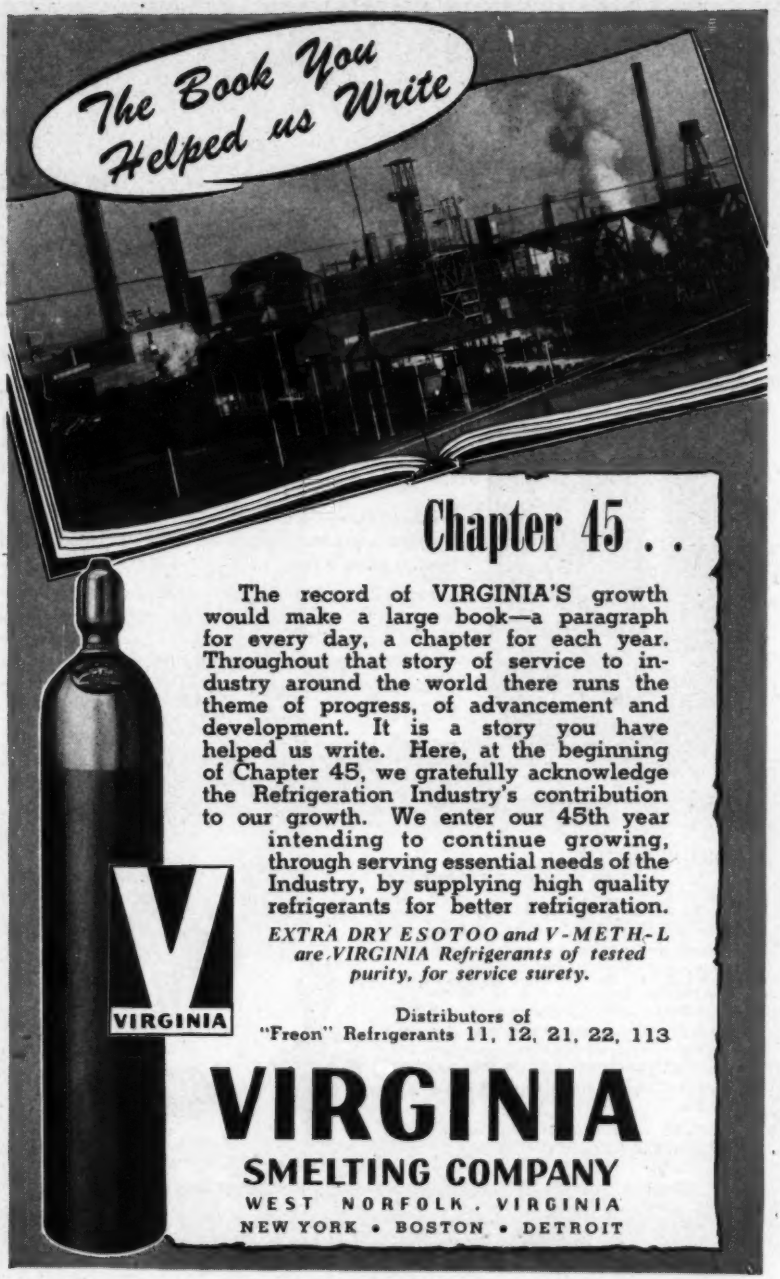
Mueller Brass Co. Valves, Fittings and accessories are sturdily and dependably built. They have a well-earned reputation for built-in quality and time-tested performance.

The Mueller Brass Co. line of refrigeration products is exceptionally complete, and all products are designed and manufactured specifically for mechanical refrigeration work. THEY ARE USED BY ALL OF THE LARGEST MANUFACTURERS THROUGHOUT THE UNITED STATES.

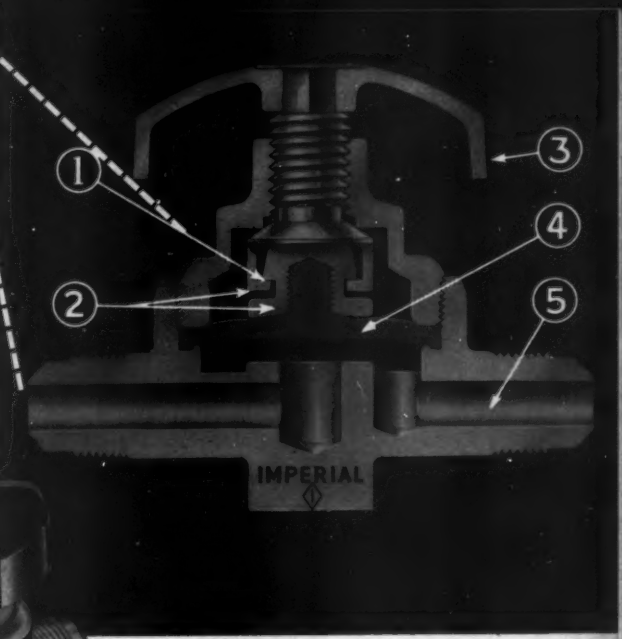
OBVIOUS CONCLUSION: Mueller Brass Co. products must be good!



MUELLER BRASS CO.
PORT HURON, MICHIGAN


The Book You Helped us Write
Chapter 45 . .
The record of VIRGINIA'S growth would make a large book—a paragraph for every day, a chapter for each year. Throughout that story of service to industry around the world there runs the theme of progress, of advancement and development. It is a story you have helped us write. Here, at the beginning of Chapter 45, we gratefully acknowledge the Refrigeration Industry's contribution to our growth. We enter our 45th year intending to continue growing, through serving essential needs of the Industry, by supplying high quality refrigerants for better refrigeration.
EXTRA DRY ESOTOO and V-METH-L are VIRGINIA Refrigerants of tested purity, for service surety.
V
VIRGINIA
Distributors of
"Freon" Refrigerants 11, 12, 21, 22, 113
VIRGINIA
SMELTING COMPANY
WEST NORFOLK, VIRGINIA
NEW YORK • BOSTON • DETROIT

No Springs ★ Either-Way Flow*



. . . *Because direct lift provides positive control

● Built along entirely new principles, the Imperial DiaSeal Valve has a sturdy, "million cycle" diaphragm that is operated by positive mechanical action in both opening and closing the valve. *No springs are used.*

Features that make the DiaSeal the outstanding valve for refrigeration service are readily apparent in the sectional view:

1. **NO SPRINGS**—DiaSeal Valve cannot "stick shut" because diaphragm is lifted mechanically. Positive control with flow in either direction.
2. **ONLY TWO MOVING PARTS**—Simple construction assures greater dependability.
3. **EASY FINGER-TIP ACTION**—Quick, sure opening and closing with less than two turns of handle.
4. **LONG LIFE DIAPHRAGM** is impervious to all common refrigerants. In actual tests, has withstood over 1,000,000 openings and closings under refrigerant pressure.
5. **INLET AND OUTLET PORTS IN LINE.** Simplifies installation.

Furnished in 2-way and angle types, with either flare or solder connections. The Imperial Triple Seal Groove is an added feature on flare connections ⅜" and larger.

Both internal parts of the Dia-al lift out with the bonnet, ilitating soldering in line. Ex-mely low height cuts installa-on space.

Ask for Bulletin 103-REF

See Your Jobber

THE IMPERIAL BRASS MFG. CO., 534 S. Racine Ave., Chicago 7, Ill.

IMPERIAL

FITTINGS • VALVES • FILTERS • FLOATS DEHYDRATORS • CHARGING LINES • TOOLS FOR CUTTING, FLARING, BENDING, PINCH-OFF AND SWEDGING.

Seeing is believing

your enthusiasm overwhelmed us!

Our sincere thanks and appreciation to the thousands at the show in Cleveland for the enthusiastic reception accorded the Tenney exhibit.

This is impressive evidence of the widespread interest in the Tenney TS-1 Valve and proves that the complimentary remarks of high-ranking industry members justify the claims made by us for the convenience and operating efficiency of the TS-1, the only true thermostatic valve.

We want to apologize to the large numbers of visitors who were unable to see the operating models of the TS-1 because of the crowds in our booth. Similar exhibits will later be available for A.S.R.E. and R.S.E.S. meetings. In the meantime, send for Bulletin TV46.

Tenney Engineering Inc

You saw its efficiency at Cleveland...

NOW—use it on your jobs!

TENNEY ENGINEERING, INC.

26 Avenue B • • Newark 5, N. J.

Telephone BIGELOW 8-3905

Manufacturers of Automatic Temperature, Humidity and Pressure Control Equipment

Your friendship is our most valued asset.
Every Mills Condensing Unit is designed
and built to hold that asset carefully in trust.

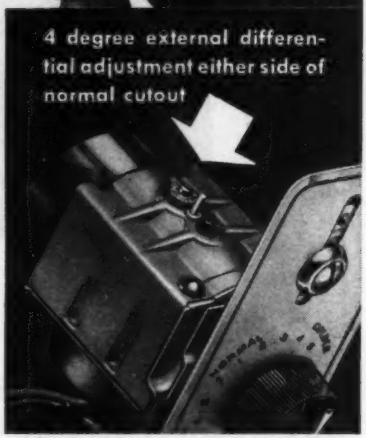
Mills Industries, Incorporated
Refrigeration Division
4100 Fullerton Avenue ~ Chicago 39, Illinois

ALL NEEDED CONTROLS

FOUND IN THE CUTLER-HAMMER REFRIGERATION REPLACEMENT LINE

Sixty percent of all refrigeration control replacement requirements are met by one Cutler-Hammer control alone . . . the *Universal* Replacement Unit. And where specific control is needed, that need is met by Exact Replacement control items in the C-H line, each individually packed, clearly labelled, complete with dial plate mounting screws, trim washers and full instructions for mounting and adjustment.

The practical advantages gained are: less capital tied up in stock; rapid and regular turnover; speedier completion of each job; greater all-round satisfaction. And in each C-H Replacement unit you will find the results of a 50-year specialization that had led to acknowledged leadership in the control field. Thus, outstanding refrigeration wholesalers recommend C-H Replacement Control and alert service organizations everywhere feature and use it. CUTLER-HAMMER, Inc., 1363 St. Paul Ave., Milwaukee 1, Wisconsin.



Bul. 9521N9 →

THIS ONE UNIVERSAL UNIT ALONE COVERS 60% OF ALL NEEDS

ADJUSTABLE MOUNTING BRACKETS

Maximum Mounting Centers 4-3/16

Minimum Mounting Centers 2-3/16

Adjustable Cutout Feature—Differential can be increased 4 degrees by turning indicator in "Hi" direction and decreased 4 degrees by turning in "Lo" direction.

Adjustable Range—Turning screw clockwise lowers setting and counter-clockwise raises settings.

Operating knob can be adjusted to meet various evaporator scale settings. New knob is ideal for varying shield thicknesses. Makes *this* control adaptable to wider range of single dial replacement jobs where overload is not required in unit.

CUTLER-HAMMER
MOTOR CONTROL
C-H

DOMESTIC, SEMI-COMMERCIAL AND COMMERCIAL CONTROL

THAWZONE

The Pioneer Liquid Dehydrant

HEARTILY ACCLAIMED

by Service Engineers Everywhere!

In these days of equipment shortage and the importance of maintaining continuous operation, THAWZONE has become more in demand than ever before. Here's why and how:

Many jobs are moisture cases that begin to kick-up before there's much moisture in them. Put in THAWZONE and go on to the next job. Nine out of ten of these jobs will be finished with the ONE call. If, occasionally, another "shot" is necessary to take care of unusual moisture, give it. This will be the exception, however.

The action of THAWZONE is positive, because it *destroys moisture and neutralizes acid by chemical action*. If you are not fully aware of what THAWZONE means in time and energy saved, we suggest that you contact your refrigeration equipment wholesaler now!

HIGHSIDE CHEMICALS CO.

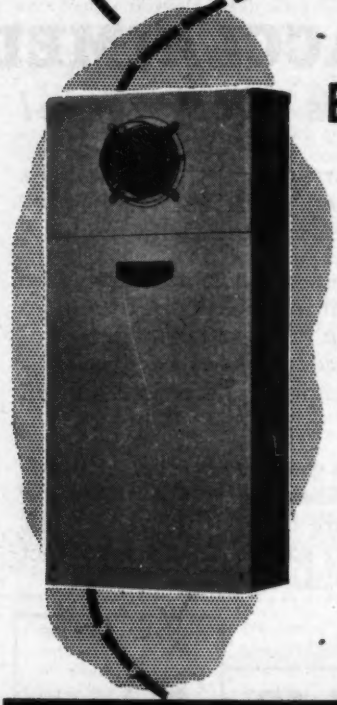
195 VERONA AVE. NEWARK 4, N. J.

ALSO MAKERS OF

TRACE

REFRIGERANT LEAK DETECTOR

Filterpure
FOR REACH-INS
with AIR PURIFICATION



Combining many exclusive BETZ improvements

★ CENTRIFUGAL BLOWER CIRCULATION

★ VERTICAL AIR DISCHARGE

★ AIR PURIFICATION

★ SCIENTIFICALLY ENGINEERED COIL SURFACE AND AIR VOLUME FOR MAXIMUM PERFORMANCE

★ BAKED ENAMEL FINISH ON RUST-PROOF STEEL

Sold by
Leading Refrigeration Wholesalers

BETZ CORPORATION
HAMMOND, INDIANA

Sensation of the CLEVELAND EXPOSITION

It is called the "FLASH PLATE" because it is FASTER freezing—operates cheaper—costs less, both in operation and maintenance.

If you did not visit the Cleveland Expositon ask your PEERLESS representative or wholesaler what this new FLASH PLATE can do to help you make a better product or installation.

DELIVERIES? ——— YES!

PEERLESS is PRICELESS in QUALITY

PEERLESS FLASH PLATES are available for—

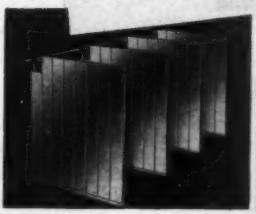
- Display Cases
- Store and Window Displays
- Food Counters
- Salad Pans
- Shelf Plates for Fast Freezing
- Soda Fountain Conversions
- Truck Refrigeration
- Farm Freezer Cabinets
- Home Freezer Cabinets
- Walk-In Coolers
- Locker Plants
- Ice Cream Cabinets
- Milk Can Coolers
- Beverage Cooler Applications
- Frozen Food Processing and Storage Plants

SOLD THROUGH LEADING REFRIGERATION SUPPLY WHOLESALERS

THE NEW PEERLESS "FLASH PLATE"

A flat, freezing surface constructed of non-corrosive aluminum plate mechanically bonded together by copper or aluminum tubes which provide the refrigerant circuit.

The NEW PEERLESS challenge to the requirements of that potential giant—the low temperature, frozen food field—was the introduction of the ALL-NEW, ALL-PURPOSE FLASH PLATES at the Cleveland Exposition which once more demonstrated the ability of PEERLESS, long a pioneer in the refrigeration industry, to meet the requirements of the most exacting buyers. Incorporated are engineering improvements which insure top performance.



These illustrations show PEERLESS FLASH PLATES as banks for locker storage, etc.

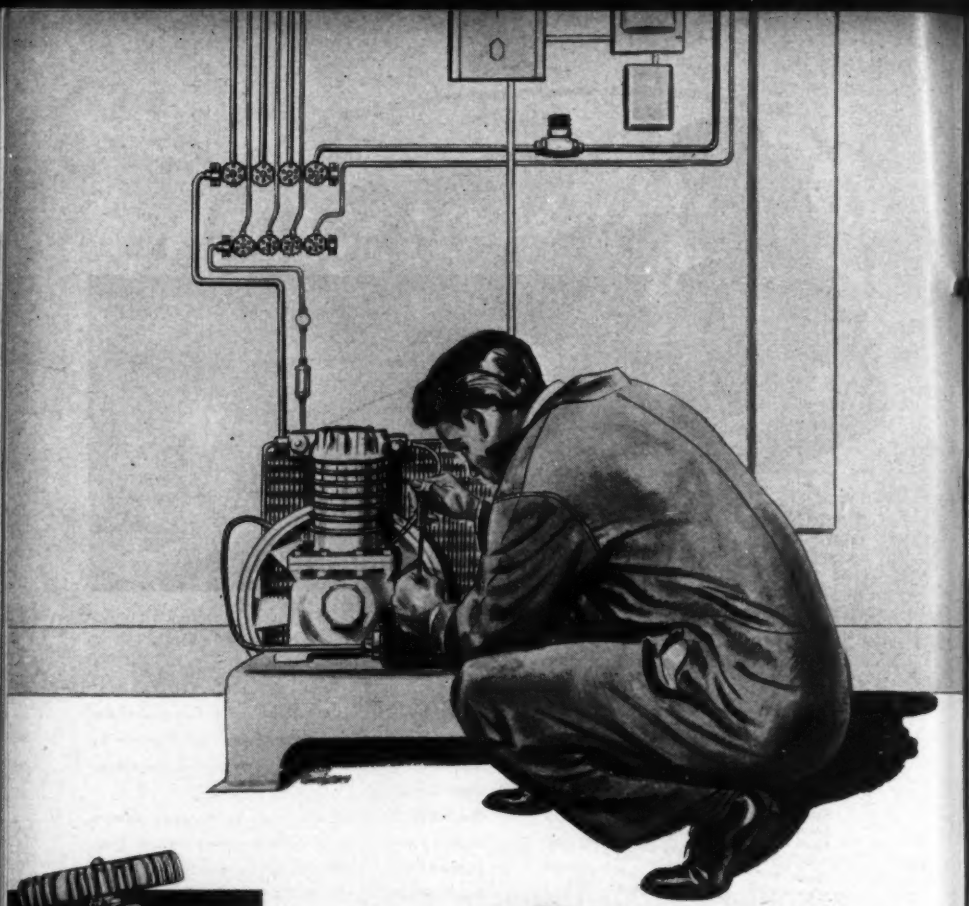
THOUSANDS saw and admired the gleaming beauty of this new freezer surface.

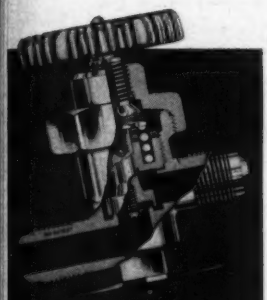
THOUSANDS felt and lifted this modern, weight-saving, efficient zero and sub-zero producing plate.

And the ANSWER was—
"IT'S PEERLESS AGAIN!"

PEERLESS of AMERICA, Inc.

General Sales Offices ... **2901 Lawrence Ave. Chicago 25, Illinois**





KEROTEST PATENTED
DIAPHRAGM PACKLESS
★VALVES
* FITTINGS
* ACCESSORIES
FOR THE
AIR CONDITIONING
AND
REFRIGERATION
INDUSTRY

YOUR KEROTEST WHOLESALER

offers valuable aid

For that sudden emergency — when speedy repairs save hundreds of dollars — and for your regular replacement stock of Valves, Fittings and Accessories — *always* contact your KEROTEST wholesaler *first*. He offers you nationally known, dependable products — ample stocks — speedy delivery — and is a reliable source of information regarding new products, new methods, new materials. His helpful advice is valuable, use it often!

HAVE YOU THE NEW 45-R CATALOG?

KEROTEST MANUFACTURING CO.
PITTSBURGH 22, PENNSYLVANIA
Branch Offices: New York • Chicago • Houston • Los Angeles

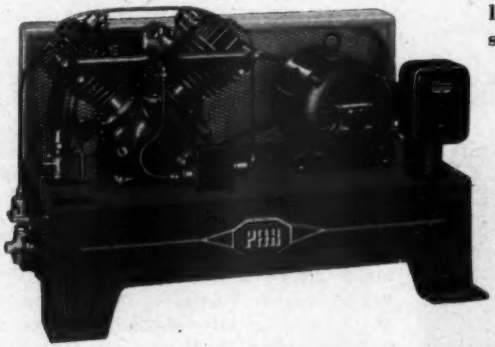
REFRIGERATION
SUPPLY DEPOT
Your Pointer
TO QUALITY
There's one of Kelvinator's 50 supply depots near you, carrying a *complete* line of refrigeration parts and supplies . . . answering a long-felt need in the refrigeration supply field.
Quality products, competitively priced—ready for delivery if you call, or mailed promptly on receipt of your order at the Kelvinator depot in your vicinity.
Kelvinator
DIVISION OF NASH-KELVINATOR CORPORATION, DETROIT
CONDENSING UNITS
REFRIGERATION PARTS AND SUPPLIES
BUY KELVINATOR FOR ALL YOUR REFRIGERATION REQUIREMENTS

ENGINEERED
to fit..
FORGED FLARE NUTS
AND FITTINGS
Prompt Shipment on most items
Electrimatic
2100 INDIANA AVE CHICAGO 16 ILLINOIS

Balanced Performance

For more economical
more dependable REFRIGERATION
You can't beat **PAR**
air-and water-cooled models
From 1/6 to 5 horsepower.

PAR BY *Lynch*



ON the job performance gives definite proof that for economical, dependable operation you can't beat Par. Par's many outstanding features give added efficiency, long life, and trouble free service.

See your Par wholesaler for complete details or write for Par Catalog R-97.

PAR—Condensing Unit Line sold exclusively through Franchised Refrigeration Equipment Wholesalers!

Lynch *. . . By Comparison — You'll Buy PAR*

Manufacturing Corporation

General Offices, Toledo 1 • Factory, Defiance, Ohio, U.S.A.

Brunner Refrigeration helps you serve better

IF COMPRESSOR LOSES ITS OIL

The Brunner Refrigeration Service Manual gives the following possible causes and remedies:

PROBABLE CAUSE	TEST and REMEDY
Lack of refrigerant:	Locate leak and recharge.
Improper evaporation design:	Too low a gas velocity through the evaporator. Should not be less than 1200 feet per minute.
Carrying too high a superheat at compressor suction:	Relocate bulb of expansion valve or adjust liquid feed to return wet gas to compressor.
Compressor operating too fast:	Return compressor speed to factory recommendation.
Short cycling:	See observation B.
Clogged expansion valve or strainer:	Clean or replace.
Insufficient oil-gas ratio charged into system:	Add oil to crankcase.
Traps in the suction piping or condensing unit too high above the evaporator:	Drain return tubing toward compressor. Loop tubing every 10 feet of vertical rise.

FUNDAMENTALS that apply only to Brunner Condensing Units? Of course not. They are common to all refrigeration systems and are emphasized in the Brunner Service Manual. That's why you should not be without a copy where troubleshooting. We'll send you a copy for only $2.50. Write to:

BRUNNER

For more than 40 years the Symbol of Quality

BRUNNER MANUFACTURING CO., UTICA 1, N.Y., U.S.A.

IMPORTANT ANNOUNCEMENT

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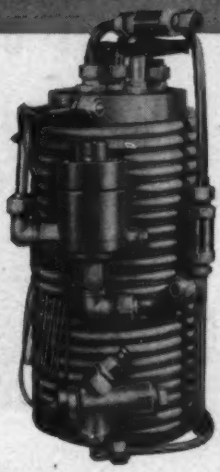

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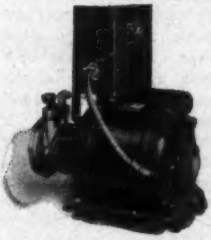
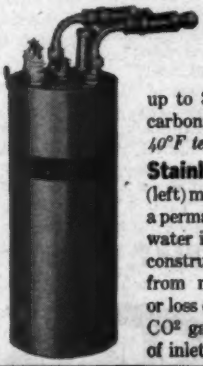


Pump-Motor Assembly consists of a corrosion proof turbine type water supply pump mounted integrally with a ½ h.p. motor, complete with starting relay, ready for immediate installation.



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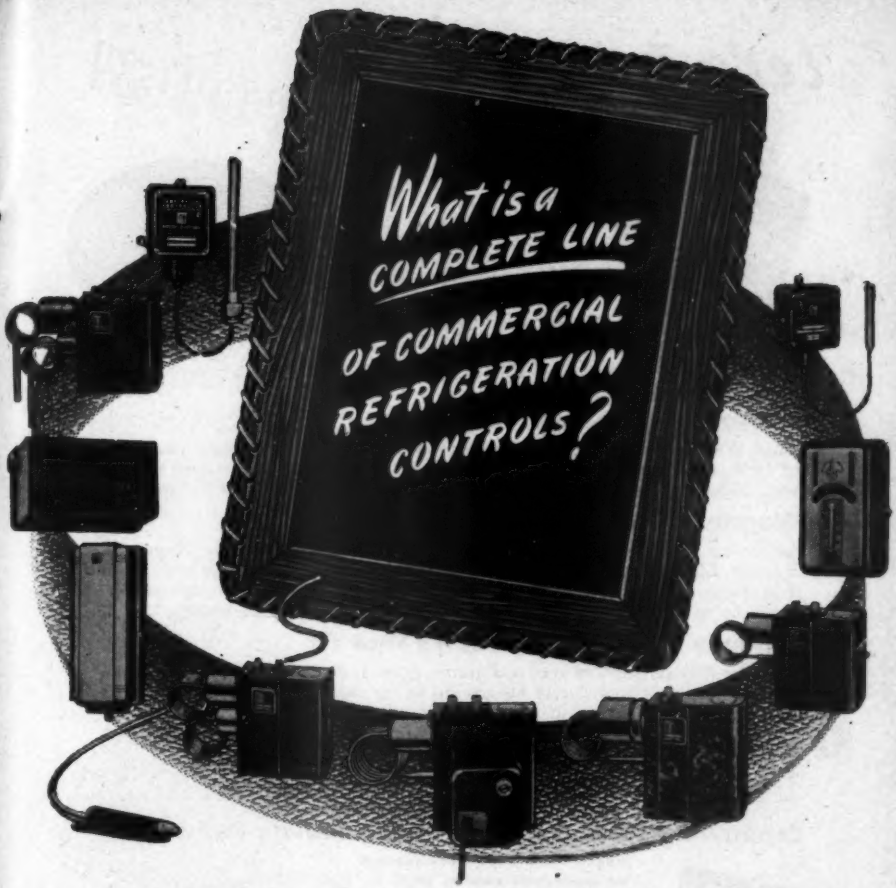

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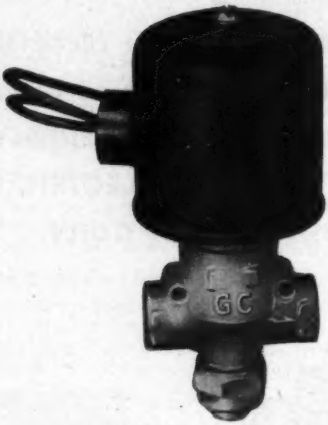

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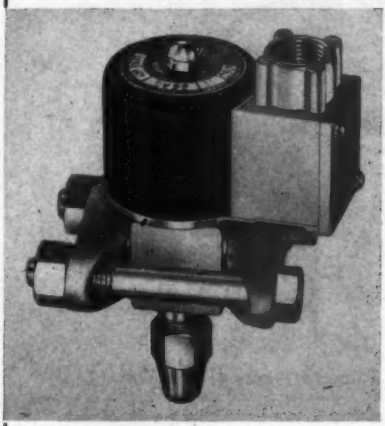

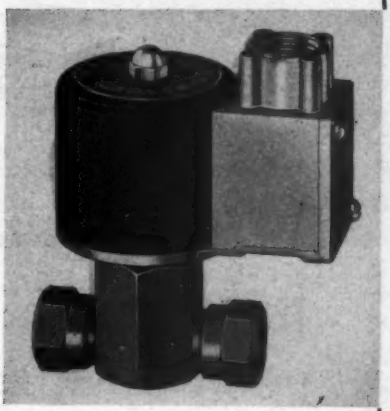

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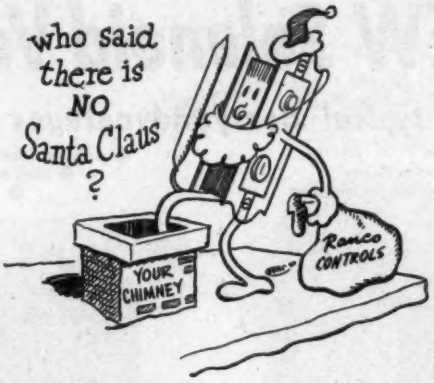

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Contents

In This Issue....29

Charging and Starting Air Conditioning Systems —*by J. N. Calhoun & F. M. Mayse*....31

Construction, Operation and Servicing Coldspot Home and Farm Freezer....36

Too Many Freezer Makers Will Glut Shrinking Market...41

Getting Down to Business, *by Waylan Clarke*....42

Questions and Answers:

Milk Cooling....44

Crankshafts Break Repeatedly....44

Unit Bounces....45

Service Pointers:

Shot of Whiskey for Refrigerator....46

Late Model Meter Miser Charging Valve....46

Oil Thrower Puller....46

Removing Excess Oil....47

Dimension Standards for Small Motors....50

Strike Curtails Freon Supply....52

Book Review—Establishing and Developing a Refrigeration Service Business....52

RSES News:

New England States Assn. Annual Meeting....56

Michigan State Assn. Formation Meeting....56

C. C. Stumpf Opens Business....56

New Charters Presented....58

Schedule of Film Showings....58

Chapter Notes....62

New and Improved Appliances....66

News of the Industry....72

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But "on the Job!"

THE NEW ALCO THERMO-LIMIT VALVE OPERATES PERFECTLY IN ANY LOCATION OR POSITION

You needn't worry about location or position with the new ALCO THERMO-LIMIT Valve. Put it anywhere—regardless of temperature. It provides positive control because it's liquid-charged.

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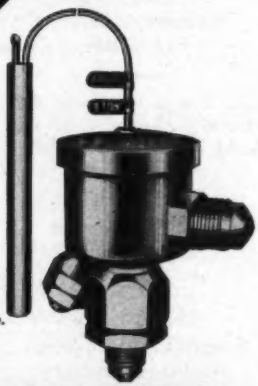

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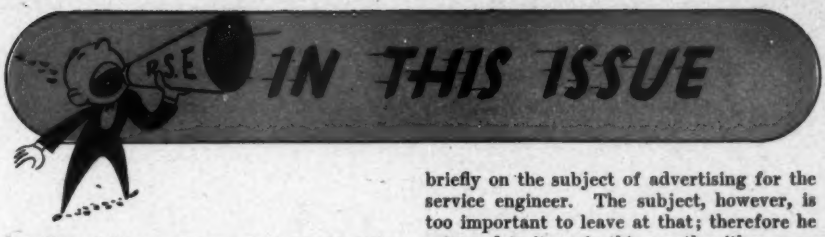

ONE of the most important parts of the Service Engineer's work on an air conditioning system is the recharging and restarting of the system after repairs or prolonged shut-down. Upon the proper routine and care taken in this phase of the work depends the success or failure of the entire repair job or the future operation of the system. A manual of general procedure which would fit any type of air conditioning system has never been published, but we think you will find the article on page 31 entitled "Charging and Starting Air Conditioning Systems" by J. N. Calhoun and F. M. Mayse, will come close to filling the need. This is the first of a series of articles on the subject.

Sears Roebuck and Co. published some months ago, one of the most complete service manuals on home and farm freezers obtainable at the present time. It contains not only service data, but some very useful test, construction and operation data. Permission to publish a large part of the manual has been secured from Sears Roebuck and Co., and the first in a series of articles appears on page 36. All models are open type Chieftain units with the exception of one. They are easy to service but there are things you should know about them before you run into your first service job on them. Read the series as they appear.

So much publicity has been given the home and farm freezer and such astronomical figures have been estimated on their future demand, that manufacturers by the hundreds have been attracted to the field. In addition to the more than two hundred now making freezers, there are an estimated 400 manufacturers preparing to enter the field. The field is definitely not large enough to support so many, and someone is going to be left holding the bag. D. C. McCoy of Frigidaire sums up the situation quite thoroughly in his article appearing on page 41.

Some months ago, Waylan Clarke, in his column "Getting Down to Business" touched briefly on the subject of advertising for the service engineer. The subject, however, is too important to leave at that; therefore he returned to it again this month with a more detailed discussion. His column appears on page 42 of this issue.

It is not often that you will encounter a compressor that insists on breaking crankshafts periodically, but that has been the experience of a contributor to the Questions and Answers department appearing on page 44.

A charging adapter for the late model Meter Miser units is not included in the hermetic charging valve kits available on the market, therefore, one reader of these columns devised one of his own and tells how in the Service Pointer section of this issue. It appears on page 46.

Standard dimensions for all fractional horsepower motors and a standard system of frame numbering should be good news to the service field, as well as manufacturers of motor driven appliances. Such standards are now in the process of adoption. Read about them on page 50.

The supply of "Freon" has been bad enough in the past few months due to a cylinder shortage, without other difficulties being added. A strike in the plants of the suppliers of carbon tetrachloride threatens to curtail it further. See page 52.

COVER

"LEAK testing the refrigeration system" is the title of this month's front cover. It illustrates part of the procedure of "Charging and Starting the Air Conditioning System" an article appearing on page 25. In these days of Freon shortages, a frequent and thorough search for leaks is more important than ever. It is a time consuming job (it must be to be thorough) and one that pays the best dividends in the saving of future service expenditures and future inconvenience for the customer.

Chief Engineer Standardized on White-Rodgers Pressure Controls because

HE COULD THROW AWAY HIS GAGES

Because the dials of White-Rodgers pressure controls are marked accurately in pounds of pressure, or in inches of vacuum, the Chief Engineer of a large refrigeration manufacturer no longer needed to rely on gages to check the operating pressures of his products.

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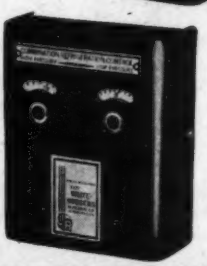

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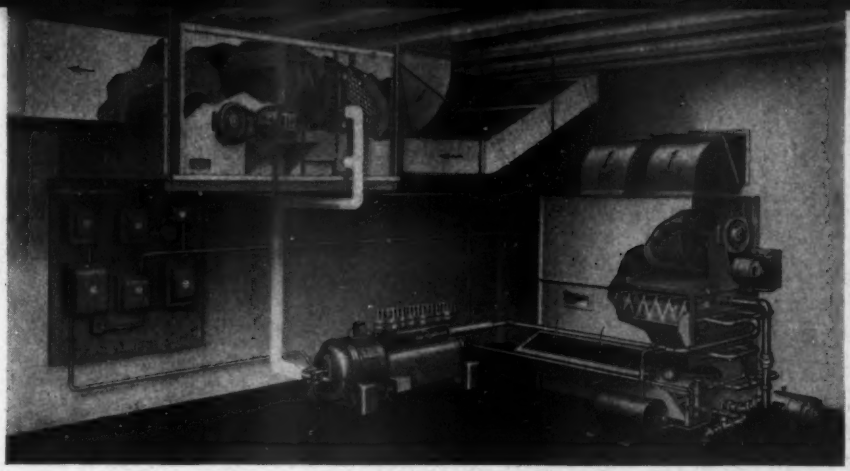


Fig. 1—Typical Air Conditioning System.

Charging and Starting Air Conditioning Systems

By JOEL N. CALHOUN and FLOYD M. MAYSE*

NO MATTER how carefully an air conditioning system is engineered and installed, if it is not properly charged and started it will be classed as a poor job. The Service Engineer thus holds the key to the success or failure of the job. The same thing applies to recharging and restarting a system after repairs; his excellent repair work may be nullified in restarting the apparatus.

If a detailed Service Manual, setting forth step-by-step procedures for the equipment being charged and started, is available, it should be carefully followed. However, such Service Manuals have not been published for all air conditioning equipment and often the Service Engineer is called upon to pump down, repair and recharge and restart a system for which, although a detailed manual has been published, he does not have such instructions readily available. In these cases he will find the time well spent if he will sketch, in writing, his own step-by-step procedure before he attempts to charge and start the system.

The major operations in charging and starting a system are:

a. Inspecting the Installation.
b. Leak Testing the Refrigeration System.
c. Evacuating the Refrigeration System.
d. Charging and Starting the Refrigeration System.
e. Balancing the Air Handling System.
f. Completing the Job.

Assume, as an illustration, that the Service Engineer is called upon to charge and start the air conditioning system pictured in Fig. 1.

This system is comprised of a refrigeration system consisting of a Freon compressor, an evaporative condenser, a liquid receiver and a Freon evaporator, and an air handling system consisting of fans, filters and ductwork. A close-up view of the evaporative condenser and appurtenances is shown in Fig. 2.

Many variations in equipment design and arrangement are encountered by the Service Engineer. Although the mechanics of charg-

* *Joel N. Calhoun, is manager of student training, B. F. Sturtevant Co., Division of Westinghouse Electric Corp., Boston, Mass. Floyd M. Mayse is Branch Manager, Westinghouse Electric Corp., Houston, Texas.*

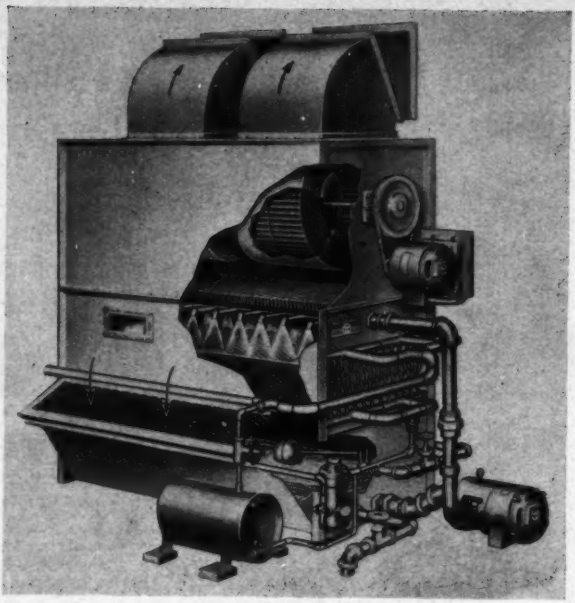


Fig. 2—Cut-Away View of Evaporative Condenser.

ing and starting air conditioning systems vary, the fundamentals involved and the results achieved are the same regardless of design.

As the first step in preparing the procedure, make a diagrammatic sketch of the equipment similar to Fig. 3. All of the service valves and gauges shown in Fig. 3 will not be installed on the system but it will be necessary that the Service Engineer provide them before the system is charged and started.

The planned procedure might then be outlined somewhat as follows.

Inspecting the Installation

(It is important that a routine inspection be made of the complete installation before attempting to charge and start the system. An inspection of this type should consume little time and will in many instances save time, prevent possible damage to the equipment, and above all may prevent injury to the Service Engineer.)

The items listed below should be checked, corrected or completed where necessary, and preliminary adjustments made where possible. (These items are listed as a guide and may vary with different systems.)

1. Foundations adequate and equipment securely fastened thereto.
2. Equipment accessible as possible.
3. Piping securely suspended and anchored.
4. Refrigerant and water piping joints securely made.
5. Electrical connections made, taped and covered where necessary.
6. Overload heaters in linestarters.
7. Belts installed and adjusted.
8. Water and electric power available to main water valve and electrical switch, respectively.
9. Water drains connected.
10. Ductwork completed or sufficiently completed to permit starting system.
11. Insulation completed where necessary.
12. Expansion valve control bulbs strapped to suction line.
13. Strainers properly installed in refrigerant and water circuits.
14. Liquid flow indicator installed in liquid line.
15. Filters installed or electrostatic cleaner properly operating.
16. Fans operable.
17. All protective devices and switches installed in the system correctly and functioning properly. (Control systems should always be connected in such a manner that the fans and controls or the controls can be operated without running the compressor but so that the compressor cannot be operated without running the fans.)

Check as follows:

(a) Deenergize the compressor motor and fan motor circuits and energize the control circuit only.

(b) Set the thermostat or, if zone control is used, set at least one of the zone thermostats to a control point well below the temperature of the place in which it is located, thereby making the controls call for cooling.

(c) Remove the cover from the high-low pressure cutout, manually close and open the contacts and observe the action of the main contactor in the motor starter. (When the contacts of the cutout are opened the

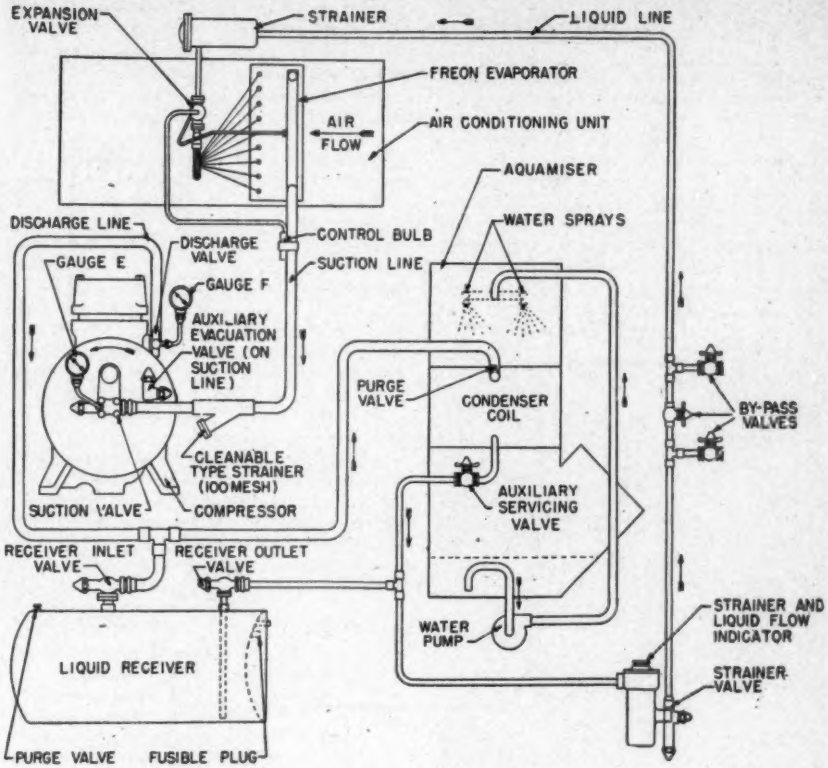


Fig. 3—Diagrammatic Sketch of Refrigeration System.

main contactor in the motor starter should drop into the open position. This indicates that the cutout is properly wired into the control circuit.)

(d) Temporarily block the low pressure portion of the cutout so that the contacts are closed.

(e) Set all thermostats to a control point well above the temperature of the places in which they are located. (The main contactor on the compressor motor starter should again assume the open position since the control system is now calling for heating or no cooling.)

(f) Carefully move the control point on the thermostat, or on one of the zone thermostats, back and forth to positions well above and well below the temperature of the area in which it is located and simultaneously observe the main contactor in the compressor motor starter and any liquid line solenoid valves. (These should be operated by the demands of the zone thermostat being used for this part of the check-up. When the thermostat calls for cooling, the main contactor of the compressor motor switch should snap closed and the liquid line solenoid valves should snap open. The action of the solenoid valve is accompanied by an audible click which can be heard when standing near the valve while it is opening and closing.) When the control for the zone being checked is operating properly, reset the control point of the thermostat to a point well above the temperature of the zone in which the thermostat is located.

Follow this procedure for each zone of control to be sure that all control equipment, which is tied into the refrigeration system proper, is operating in a satisfactory manner.

(Pneumatic-electric control systems will

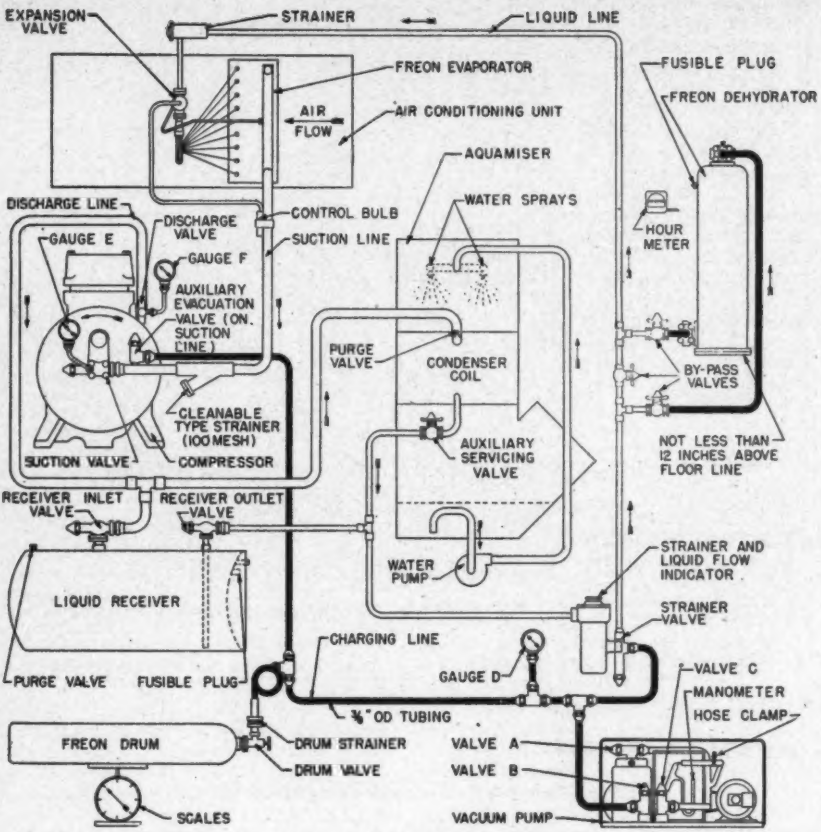


Fig. 4—Connections for Vacuum Pump, Freon Drum, Freon Dehydrator, Hour Meter and Gauges.

require a pneumatic-electric switch which is wired into the electric control circuit in series with the other electric control devices. This switch is adjusted to operate the compressor linestarter whenever any one of the pneumatic thermostats calls for cooling.) Be sure that as each zone is checked the control point of the thermostat is reset to a point well above the temperature of the zone before proceeding to the next thermostat or the next checking operation.

18. Fans and pumps rotating in proper direction and all bearings lubricated.

19. Water in sump, float properly adjusted, strainer installed, and water sprays operating properly in the evaporative condenser.

20. A by-pass connection provided in the liquid line for connecting a Freon Dehydrator. (The use of a Freon Dehydrator is recommended for all systems using Freon as a refrigerant.)

21. An auxiliary valve installed in the suction line for exacuation connection.

If the system is equipped for winter heating, the heating equipment and connections should also be checked.

Leak Testing the Refrigeration System

The refrigeration system should then be tested for leaks as follows:

1. Connect vacuum pump, Freon drum, Freon Dehydrator, hour meter (to motor linestarter terminals), and gauge D as shown on Fig. 4. Do not connect gauges E and F at this time.

2. Open all refrigerant valves on the system to the "backseat" position; except that the suction and discharge valves should not be opened until charging is commenced in cases where a new compressor received from the factory, and containing a holding charge of Freon, was installed.

3. Open any solenoid valves in the refrigerant lines so Freon vapor can pass through the entire system.

4. Open the gauge port in the strainer valve by turning the valve stem to the "mid" position.

5. Close the valves on the vacuum pump and manometer.

6. Slowly open the valve on the Freon drum and allow Freon vapor to pass into the system until the loss of weight indicates that 5 pounds have passed into the system.

7. Open the strainer valve to the "backseat" position, close the auxiliary evacuation valve, remove the connection from the Freon drum, and connect a drum of carbon dioxide to the system by means of the same tubing.

8. Open the auxiliary evacuation valve and turn the strainer valve to the "mid" position. Slowly increase the pressure on the system until gauge D registers about 30 pounds per square inch.

9. Light the leak detector and make a systematic check for leaks by slowly passing the open end of the exploring tube all the way around all joints, connections, valves and valve stems (Figure 5). Be sure to follow a definite sequence so that all joints are tested. *Leak testing cannot be hurried.*

Soap Bubble Method of Leak Testing. In areas where it is not permissible to use an open flame or when the exact source of a leak cannot be located with the torch, the use of a soap and water solution will assist in the detection of leaks. The solution should be of a consistency to bubble freely. A solution of soap and water with a few drops of glycerine added is satisfactory. In areas where water is abnormally hard, soap will not dissolve well. The resulting scum is unsatisfactory for this sort of test. In this case use rain or distilled water to make the solution. It is best applied with a small brush and should be applied and wiped off, joint-by-joint, as the testing progresses.

10. If a leak is found, make necessary repair, replacement, or adjustment before proceeding further. If a soldered joint is found to be leaking, do not attempt to merely "patch it up". Release all the pressure in the system, observing safety precautions, and completely dismantle the joint. The joint should then be cleaned and resoldered. If a leaky gasketed joint does not respond to tightening replace the old gasket with a new gasket.

11. When leaks have been repaired, again raise the pressure in the system to about 30 pounds per square inch with Freon vapor and carbon dioxide, as outlined above.

12. Slowly increase the pressure in the system to 150 pounds per square inch by adjusting the pressure regulating valve on the carbon dioxide drum. (Do not exceed 150 pounds per square inch pressure or the expansion valve may be damaged. However, because of local ordinances, it may be necessary to use a higher pressure to test the high pressure side of the system.)

Fig. 5—Leak Testing Refrigeration System.

13. Repeat the leak testing with the leak detector.

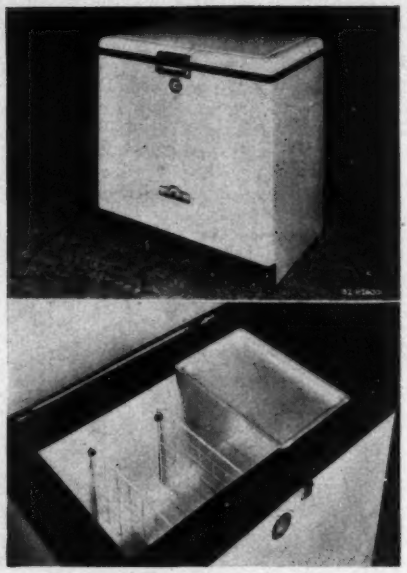
14. If time permits, it is advisable to let the system stand overnight under pressure. If this is done, be certain that the carbon dioxide drum is disconnected, and that all gauges are shut off and valve stem caps tightly in place. If the system is "tight", there should be no appreciable difference in pressure gauge reading the next morning. Obviously, if the pressure has dropped appreciably the leak testing must be repeated until the defect is located and repaired. (The pressure will rise or drop about 8 pounds per square inch for each 10-degree rise or drop in temperature, respectively, and such change should be disregarded.)

15. When the system has been proved leak-proof, remove the carbon dioxide drum.

(To be Continued)

Construction, Operation an

Coldspot Home an



An external and interior view of the 6 cu. ft. Coldspot freezer. The 9 cu. ft. model is similar in appearance and cabinet design.

THE 1946 line of Coldspot freezers built by Seeger-Sunbeam Corp. and merchandised exclusively by Sears, Roebuck and Co., bid fair to become one of the top sellers just as the Coldspot refrigerator did in pre-war days. As materials permit increased production, more and more of these units will be reaching out to all parts of the country where the independent service organizations will be called upon to adjust and service those that are not within easy reach of factory service. For this reason, construction, operating and service data are provided here for the guidance of the field man.

General Description

The 1946 line of Coldspot freezers are all of the chest type. There are 4 models in all: 198.511060—6 cu. ft.; 198.511090—9 cu. ft.; 198.511120—12 cu. ft.; and 198.511180—18 cu. ft.

Cabinets are all steel welded construction with finish baked on a bonderized surface, same as household refrigerators. The refrigerating systems use Tecumseh condensing units; capillary tube refrigerant control on the 6 cu. ft. and thermostatic expansion valves on the 9, 12, and 18 cu. ft.; simple continuous copper tube evaporator outside the liner; heat exchanger; and "Freon 12" refrigerant.

Common or interchangeable parts have been used wherever possible. These include thermometers, controls, escutcheons, latch handles, hinges, expansion valves and condenser grills. The doors, with hinges and handle attached, are removable to facilitate moving the freezers through 30 in. doors and passages.

Description of Features

The entire exterior is made from 20 gauge steel stampings welded together. A heavy return flange on the top edge makes a rigid, solid surface all the way round for the door gasket to close upon. The bottom strengthened with cross rails, the corners are reinforced and all hardware attachment is backed up with generous tap plates (see Fig. 1). The complete assembly is bonderized and white synthetic finish baked on in the same manner as the household refrigerators.

All welded seams, tap plates, T-nuts, filler strips and reinforcements are sealed with hot asphalt. All tube passages, breaker strips and cover plates are sealed with permagum. The rubber collar is cemented to the return flanges forming the top edges of shell and liner (see Fig. 1).

Liners are one-piece seam-welded 20 gauge steel except that in the 12 and 18 cu. ft. models the freezer and storage compartment liners are made separate and bolted together on the outside. The finish is one ground and one white coat of porcelain with not even a screw hole in the interior surface. The top edge is a heavy return flange for breaker strip attachment (see Fig. 2).

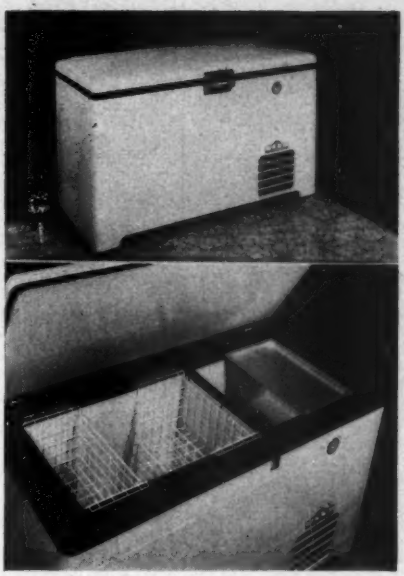
Insulation

Fiber-glass batt insulation of 2½ lbs. density and "K" factor of .26 is used all over except for load carrying beams of board insulation under the liners.

and Servicing

and Farm Freezers

This is the first of a series of articles on the Coldspot Freezer, taken by permission from the service manual issued by Sears Roebuck and Co. This, and succeeding articles, will describe in detail constructional features, operation data, test specifications and service information on the four models now being produced.



An external and interior view of the 12 cu. ft. model freezer. The appearance and arrangement of the 18 cu. ft. model is similar.

Ordinary methods of restricting conduction of heat are not good enough for freezers. In the Coldspot the breaker strip carries no load; it simply positions the liner. It is made of ⅛ in. tempered Masonite 3½ in. wide, made impervious to moisture by dipping in hot no-oxide grease. The edges are attached to the return flanges of liner and shell by screws, and the joints sealed with permagum. A ¼ in. thick filler strip of board insulation fills the space between breaker strip and rubber collar (see Fig. 8). The corners of the collar are made with lock joints and vulcanized. This combination of breaker strip and rubber collar has eliminated all sweating at relative humidities up to about 85%.

Doors

The door design is the result of numerous tests. The maximum of convenience had to be combined with the minimum of heat loss and freedom from frost accumulation. The first tests determined that the full overlapping door was least susceptible to sweating and frost formation in the clearance space. This is due to the sealing line being removed as far as possible from the top edge of the cold liner. Any leakage at the gasket will migrate to the inside edge and leave the gasket frost free. The next tests determined that mullions (wall section between two doors) were very difficult to insulate and tended to sweat easily. That is why single doors are used on all except the 18 cu. ft., and why a mullion 10 in. wide is used on it. Next, it was found that unless adjoining doors were spaced at least 3 in. apart, sweating of the mullion persisted. Finally, by building doors of various thicknesses, it was found that 2 in. of insulation was practically as good as 4 in. in a chest type door. This is due to stratification of air in the storage compartments immediately under the door. A freezer was loaded with cakes of ice wrapped to simulate food and with about 50% of the bottom of the 2 in. door in direct contact with the ice. Then with the ice cooled to zero degrees, the relative humidity was increased in the test room and it was found that the door did not sweat any sooner than did other parts of the cabinet. There are only two pieces to the door. By attaching the panelyte inner door panel directly to the exterior panel, a strong, light, rigid box construction results (see Fig. 3).

Hardware

Latch, handle and hinges are simple, sturdy and surface mounted. The hinges are made from two simple stampings with pins for coil springs of various strength.

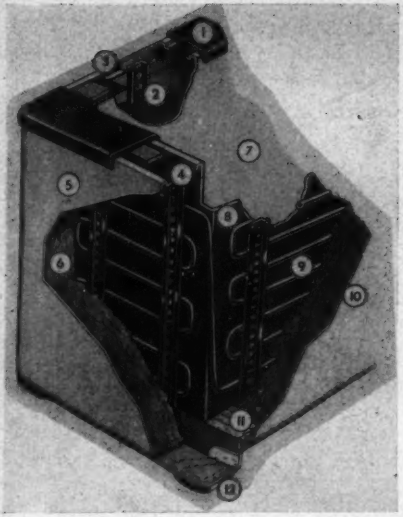


Fig. 1—Construction details of Coldspot Freezer in which are shown: 1. Molded rubber cap—reduces heat transfer, and prevents sweating, and reduces frost accumulation. 2. Steel tap plates—take the strain off hinges and handle operation. 3. Double strength flanges—at top of shell and liner provide flat surface for gasket. 4. Non-metallic breaker strip—stops heat transfer between shell and liner. 5. High-baked synthetic finish — applied over rust-proofed bonderized surface. 6. Insulation—highly efficient; better than cork; "k" value .26. 7. Porcelain interior—sanitary, cleans like a china dish, will never peel, flake or rust. 8. Seam-welded steel liner—no joints or cracks; perfectly smooth; not even a screw head to mar surface. 9. Evaporator—continuous tube copper coil clamped and bonded to the liner with thermal-mastic. 10. All-steel welded exterior—heavily reinforced; will not warp or open at seams; completely sealed against moisture penetration. 11. Rigid board insulation beam—carries the load. 12. Built-in gliders—protect floors and carry shipping and handling strains.

When the door is closed, the springs are under tension and aid in lifting the door when the latch is released. At about 65 degrees opening, the door is stopped and remains at that position. The springs let the door down lightly so there is no danger of injury to hands or fingers. The hinges project 3½ inches back of the cabinet to insure air circulation. The handle is large with plenty of clearance for fingers and incorporates the latch in one side. On the same side, a fixed plate is mounted with a

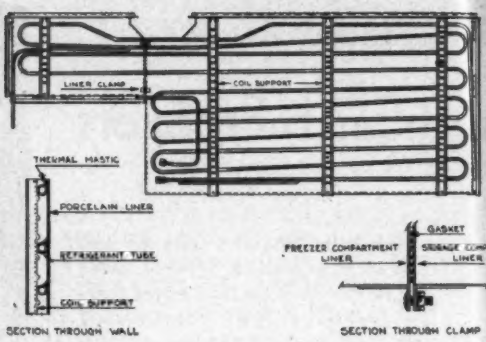


Fig. 2—Method of clamping freezer compartment and storage compartment together.

hole that matches holes in the handle for a padlock. The inner door panel must be at least partially disassembled to get at the handle mounting screws inside the exterior panel. Due to difficulty of assembly of handle to base plate, it was thought inadvisable to make the handle removable by exterior mounting screws. The latch strike and hinge butts have elongated holes for adjusting gasket tension (see Fig. 3).

Temperature Indicator

The temperature indicator is a vapor-tension, gearless, bourdon tube type thermometer with 10 in. of capillary tube and 7/16 x 1¾ in. bulb. It is protected against —50° and +150° F. The bulb is located in a ⅝ in. well midway between two refrigerant tubes (see Fig. 6). It is cooled by conduction from the refrigerant tube and warmed by heat leakage through the wall. It indicates very closely the temperature in the center of the storage compartment except that when operation is interrupted, it will warm up much faster than the load. In one hour it will be 10° to 15°, and in 24 hours, 35° to 40° warmer. The case is attached to the shell by three screws through the flange and sealed with permagum. The bezel has tabs bent over the edge of the case flange which drop through slots for installation and removal. The zero zone range is —5° to +5°.

Cold Control

The control or thermostat is a standard Cutler Hammer household refrigerator control with modified knob travel. The normal operating position of the knob for a zero

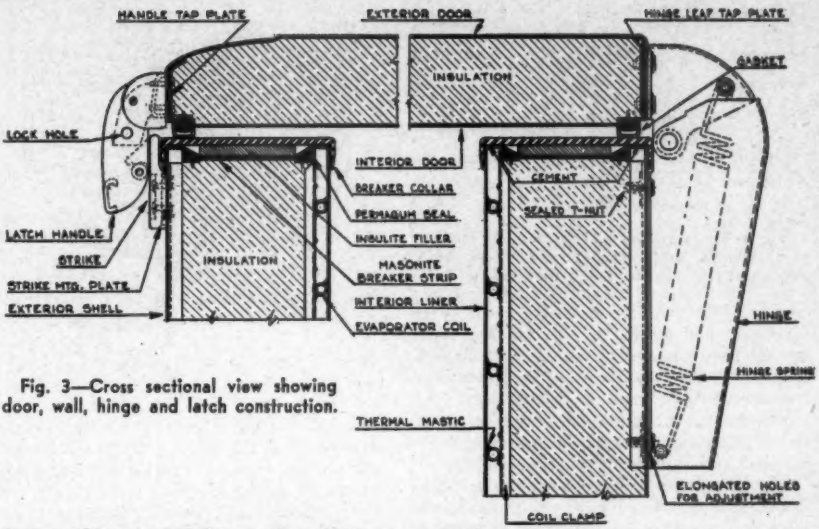


Fig. 3—Cross sectional view showing door, wall, hinge and latch construction.

degree cabinet is straight up. Specifications for the storage (warmest) position are:

Cut in at + 3° to + 6°
Cut out at — 4° to — 7°
Differential 9° to 11°

The control sensitive bulb is a straight ⅛ in. O.D. capillary, 72 in. long without enlarged bulb on the end. The control point is a well, soldered to one of the refrigerant tubes (see Fig. 6). In all cases the control bulb is near the end of the coil so that should a shortage of refrigerant develop, the customer would be warned by continuous running and low temperature. The control is attached to the shell by screws, the escutcheon has spring fasteners on the back which snap into holes in the shell, and the knob is held on the shaft by friction. Wiring connections are by screw terminals.

Refrigerating Systems

The 6 cu. ft. unit has a direct-driven, single cylinder, reciprocating, hermetically sealed, internally spring mounted, ⅓ hp. compressor. A Spencer relay and thermal overload are mounted on the outside of the housing in the terminal box. A natural draft condenser is used. Baffles and flue direct air from the front of the cabinet through the condenser, over the compressor and up the back of the cabinet. By removing the flue, all valves and wiring are readily accessible. Both valves are ⅜ in. SAE male flares (see Fig. 4).

The 9 cu. ft. unit has a belt-driven, single cylinder, reciprocating, conventional type compressor driven by a ¼ hp. condenser start motor at 640 rpm. A fan-cooled 2 pass

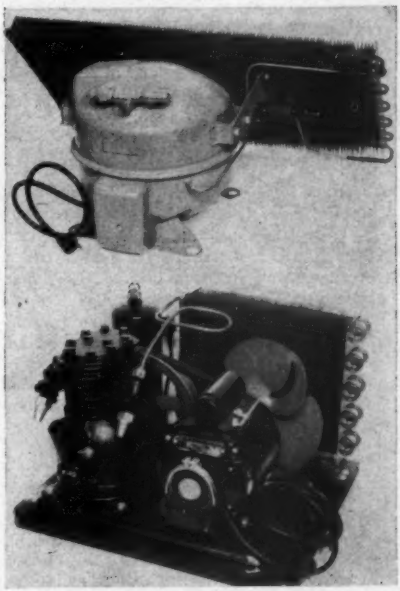


Fig. 4—The 6 cu. ft. model is powered by a Tecumseh hermetically sealed unit. The 9, 12 and 18 cu. ft. models are equipped with Tecumseh conventional open type units.

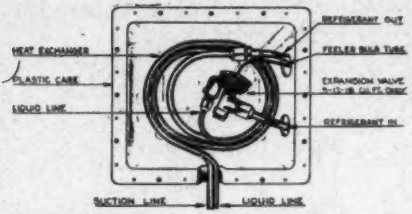


Fig. 5—Showing the arrangement of the expansion valve, heat exchanger and thermo bulb well on the 9, 12 and 18 cu. ft. models.

condenser and 90 cu. in. receiver are used and the unit is mounted on rubber. The belt is ⅝ x 84 in. Suction valve is ⅜ in. and receiver valve is ¼ in. SAE male flare.

The 12 cu. ft. unit is the same as the 9 cu. ft. unit except the compressor is twin cylinder and runs at 610 rpm.

The 18 cu. ft. unit has a larger twin cylinder compressor than the 12 cu. ft., is driven by a ⅓ hp. motor at 540 rpm. and has a 3 pass condenser.

All conventional units use the same rubber mounting, base plate, receiver, valves, belts, flywheels and fans. Compressors, condensers, motors and motor pulleys differ. All valves except the receiver valve are backseating.

Refrigerant Controls

The 6 cu. ft. model uses a capillary tube feed, .086 I.D. and 17 ft. long. It is soldered to 5 ft. of the suction line to form a heat exchanger which is coiled in the valve box. The inlet end of the capillary is soldered to a ⅜ in. section containing a 150 mesh screen.

The 9, 12, and 18 cu. ft. models use a Detroit Lubricator Company model 894 nonadjustable, ¼ ton, gas charged, 7° superheat, and 15 psi maximum pressure, thermostatic expansion valve. Three feet of the ¼ in. liquid line is soldered to the ⅜ in. suction line to form a heat exchanger, and coiled in the valve box. The feeler bulb is inserted in a well soldered to a refrigerant tube near the end of the coil (see Fig. 5).

Evaporators

All models use continuous copper tube, serpentine coils, clamped to the outside surfaces of the liners. The 6 and 9 cu. ft. coils are ⅜ in. O.D. and the 12 and 18 cu. ft. are ½ in. O.D. Thermal mastic is laid along the coil to bond it to the liner for efficient heat transfer. On continuous run tests, as

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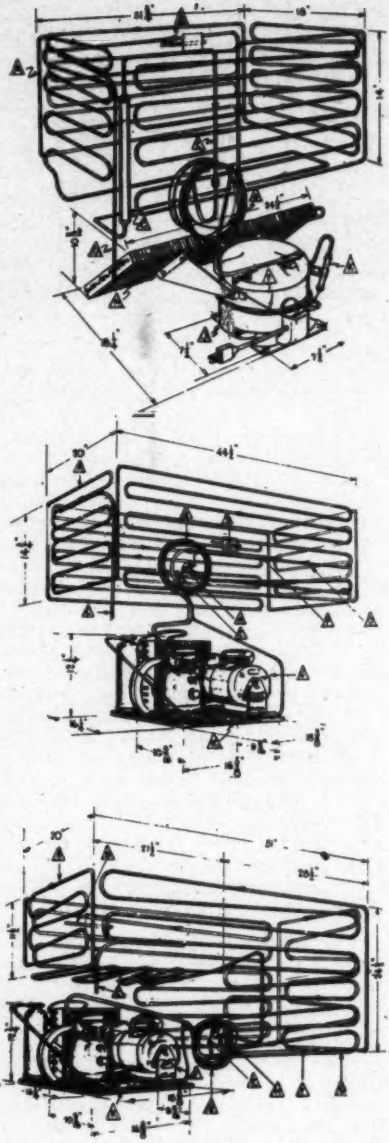


Fig. 6—The complete refrigerating systems employed in the: Top—6 cu. ft. model; Center—9 cu. ft. model; Bottom—12 cu. ft. model. The 18 cu. ft. model is similar to the 12 cu. ft. model.

Too Many Freezer Makers Will Glut Shrinking Market

AN OVER-ABUNDANCE of new and inexperienced manufacturers may hamper progress in the home freezer field, D. C. McCoy, of Frigidaire Division of General Motors, food technologist and frozen food authority, told the Frozen Food Clinic of the Electric Institute of Boston during a recent meeting in the Kenmore Hotel, Boston, Mass.

Mr. McCoy, who spoke on "Selling Home Freezers to the Consumer," pointed out that latest estimates indicate that about 400 manufacturers of various experience and scope have signified an intention of entering into home freezer production. He warned that "experience" and adequate "research" are prerequisites in solving the many highly technical design and construction problems inherent to low temperature refrigeration equipment. These factors are necessary in putting products on the market that will win wholehearted, enthusiastic customer acceptance.

"It is one thing to build a household refrigerator for storing food for a relatively short period at 40 to 50 degrees," Mr. McCoy pointed out, "but it is entirely a different matter to build low temperature equipment for storing large quantities of food for months without adequate background and know-how. A large percentage of the newcomers have had little or no actual experience in the low-temperature production field.

"As experienced manufacturers start moving home freezers on the market in large quantities, some of the questionable products will be increasingly difficult to sell. Price cutting is bound to follow as a sales stimulant. When this catalyst is no longer effective, it usually follows that many manufacturers will turn to product dumping."

Mr. McCoy said that unreasonable and impossible claims will probably be made by some inexperienced selling organizations. "There will be sales stress on relatively unimportant details," he commented. "Mountains will be built out of molehills. The public will be confused and dealers and salesmen vexed and frustrated."

Mr. McCoy also questioned the highly publicized market potential of the home freezer. "Market estimates have varied in predictions from 200,000 units to two million a year," he pointed out. "It is my belief that the two million estimate is purely crystal-gazing. On the other hand a mere 200,000 units per year may be too low. This is a new and untried business—without statistics upon which to base accurate conclusions."

In viewing the untried market, the frozen food expert said that influencing factors have been "fad, famine and funds."

"As a fad," he explained, "some think that the home freezer sales will be based upon 'keeping up with the Jones'—and will eventually die out. Others think that the fad will spread by word of mouth and a large volume of business will result.

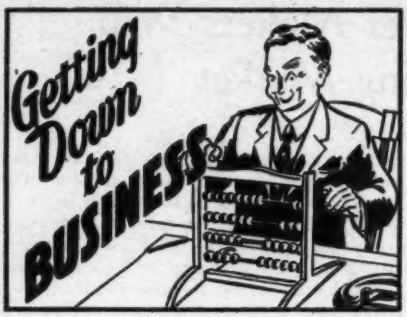
"As far as famine is concerned, food shortages during the past few years have materially increased the desire and demand for these freezers. As soon as food is plentiful again, the motivating desire for the home freezer may wane unless intelligent sales activity is put forth.

Buying Power Shrinking

"Adequate funds have apparently been available for purchasing these low temperature cabinets for the home. However, recent surveys have revealed that many wartime family savings are being dissipated by strikes, shortages and the high cost of living."

Protective steps have already been taken by the National Electrical Manufacturers Association and other interested organizations according to Mr. McCoy. The home freezer has been defined and test standards have been established to guide manufacturers and protect the public. NEMA has a booklet in preparation to educate the users of home freezers on proper freezing and storage technique.

"In my opinion the locker plant and home freezer are not competitors. They supplement each other and there are many services that locker plants can render to a home freezer user, which can be a continuing source of profit to the locker operator," Mr. McCoy commented.



BY WAYLAN CLARK

YOU studied hard for it! You served your apprenticeship! You sacrificed! Yes, you probably skimped in a good many ways to build up a semblance of a cash reserve—well, at least enough probably to pull you through a month or two. In short, your big day has arrived! You're in business for yourself!

Yes, Joe Doakes Refrigeration Service was theoretically off to a BIG start. But where were the customers stampeding toward your door? Where was the incessant jangling of your telephone? Where were the service jobs that were going to keep you booked up tight for the next few weeks?

If we must be trite, Mr. Doakes, "Rome wasn't built in a day." Nor can you expect your service business to set the world on fire overnight just because you sent an announcement through the mails and planted a publicity story in the Gazette.

You see, Joe, people are inherently tranquil (lazy is too harsh a word for it). They are slow to move, slow to appreciate the other fellow, slow to be impressed. They aren't going to look for you; they aren't going to come flocking to you. They won't step one foot out of their way to hunt you up unless you break up their tranquility a bit. You've got to disturb them in a nice way. The secret of your success lies in *your* going to *them*, in your getting *them* to come to *you*. Once you blast them into moving in your direction, Joe, you've got to keep them coming.

In an earlier issue, we talked generally about advertising—keeping your name constantly before your community through newspaper advertising, telephone listings, letters, circulars, postcards—all of the devices which involve the use of paper, ink, and type. Now let's get down to specifics—certain basic facts about advertising that successful small businessmen have long since learned and applied and continue to apply to stay successful.

Number one fact, and one which service shop operators sometimes find hardest to swallow, is that a one-time mailing or one-time advertisement is simply wastage of time, money, and effort. Why? Because, as was pointed out earlier in this column, people are quick to forget you. True, a single letter or single advertisement might catch a prospect at the "psychological moment"—when he's in immediate need of refrigeration service. But such luck, and that's what it is, has against it terrific odds, as you can readily appreciate. You must remind your community continually of the fact that you are ready to serve it—and certainly, when you are just starting out, when you have no "trade" built up, you have to hit advertising hard and often! You can taper off only when you are well established.

Number two fact about advertising concerns the basic principles of preparing the advertising—what you have to say and how you say it. Here there is a pattern tried and proved by all successful advertisers whether they be small business men or big business operators. There are four basic elements your advertisement should contain whether it be newspaper advertising or letters, circulars, yes, even postcards.

1. Regardless of what medium you use, you must first get the *attention* of your prospect.

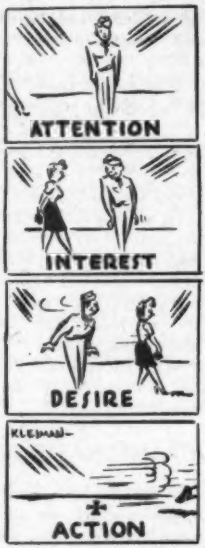
2. Once attracting his attention, you must *interest* him.

3. If you have captured his interest, you must then "prod" him, create a desire, need, want on *his* part for your services.

4. And finally, after convincing him that he needs your services, you must provide

him the means of doing something about it. Let's call this *action*.

There you have the basic ingredients of *any* sound advertisement, and remember, this applies to newspaper display advertising, or any other medium involving the printed or written word.



Now let's put these principles to work. What is an attention - getting device? It may be an illustration—or a drawing or picture—or it may be a slogan or headline, or a border around your ad, or any design which has sufficient "eye appeal" to draw your reader's attention. In a letter, postcard, or circular, it may be any or a combination of these things along with the letterhead or your "logotype" or "signature"—the identification of your business name.

Suppose you were to plan an advertisement in display in your local newspaper and you plan to run it as one of a series in late Spring or early summer. For attention-getting, you might use, for example, a drawing of a refrigerator, in cartoon style, animated perhaps to look like a person. There may be a pained look on the "Face" of the refrigerator and it may be on "crutches." Alongside, you carry a headline explaining the illustration and hinting at the major point of your advertisement, for example: "YOU CAN'T AFFORD A CRIPPLED-UP REFRIGERATOR THESE DAYS!"

This same cartoon can be developed perhaps to spread over the entire series of ads—a "sick" refrigerator in bed and a service man bending over it as if he were the "doctor"—a refrigeration service car decked out like an ambulance and speeding down the street—a "doctor" with a stethoscope listening in to the functioning of a refrigerator. Such attention-getting devices may be used more than once. You can employ them in your newspaper display advertising and use them, too, in your direct-mail—letters, circulars, postcards.

Another important and effective attention-getting device is a picture of yourself. This latter idea is sound in many respects. Have you ever considered the fact that possibly the greatest single thing a small business owner possesses is his own personality? His services may be identical to those of his competitor, the quality of his work may be substantially the same as that of any other refrigerator repair men, but of one thing he may be certain—he has a God-given identity, personality, individuality, call it what you will, that no other single person can possess.

Thus your attention-getting device may be any or all of the above techniques, and there are many more, too, designed to draw the attention of the reader, to divert his attention from something else to the message you have for him.

Here's another point about attention-getting, one concerning letters. It has been proved by much testing that a headline in a sales letter will capture the readers' attention and pull better returns than a formal salutation. *And* you can get a processed letter—mimeograph or multigraph—at less cost to you if you avoid the time and effort of filling in each letter with a name and address. For instance, a letter might carry a two-line headline such as:

"Your Refrigerator
Is My Business"
or
"A Major Overhaul of Your
Refrigerator Costs You Money"

Aren't these far more effective, far more interesting than the customary, and to-be-expected, "Dear Mr. Jones"?

Once capturing your reader's attention, your advertisement or letter must *hold* it. This, in advertising parlance, is called "Interest". Although some degree of interest has been obtained with your attention-getting device, it is up to you now to carry your prospect along into your message. Here you may "appeal" to him by touching on one of the so-called basic drives that motivate all people and that usually arouse a "response." You see, all of us, big or little, wealthy or poor, go through life motivated by certain forces. Without these motivations there would be little sense in living. For instance, we seek comfort and security; we seek to better ourselves; we seek health and long life; we seek companionship and a family. If you look into most advertisements, you will see these drives played up—most obvious, of course, in cosmetics and perfume

(Continued on page 54)

QUESTIONS and ANSWERS

On Problems of Servicing and Installation of Refrigerating Equipment—Send Your Problems to the Question Box.

MILK COOLING

QUESTION 776: Would you kindly give us the following information as soon as possible for cooling 2000 gallons of brine from room temperature to 10° F., using ⅞" OD copper tubing for coils and "Freon" refrigerant. We would like to know how many feet of ⅞" OD copper tubing will be required for cooling coil and what size compressor we would have to use to handle the above job. The brine will be circulated from storage tank to milk cooler and returned. We are replacing a defective coil in the storage tank and we figure cooling coil not sufficient to handle the job.

Would you also recommend a refrigeration book that would give us tables showing sizes of pipe to be used on different refrigerants to obtain a selected range of temperatures?

ANSWER: Your questions lack several pertinent points from which to base a figure. Assuming the 2,000 gallons has to be cooled from 70° to 10° each day of 24 hours, you will find the amount of tubing figured as follows:

2,000 gals. x 10.35 lbs. per gal. = 20,700 lbs.
20,700 lbs. x .65 (specific heat) = 13,450 Btu.
13,450 Btu. (per °) x 60° = 810,000 Btu.

$$\frac{810{,}000 \text{ Btu.}}{24 \text{ hours.}} = 33{,}800 \text{ Btu. per hour.}$$

Heat transfer per sq. ft. of surface in brine at a velocity of 300 feet per minute is 150 Btu. per hour.

$$\frac{33{,}800 \text{ Btu.}}{150} = 222 \text{ sq. ft. of surface}$$

$$\frac{144 \text{ sq. in.}}{3.1416 \times .875 \times 12} = 4.37 \text{ ft. of tube per sq. ft. of surface.}$$

222 sq. ft. x 4.37 = 970 lineal ft. of tubing required.

33,800 Btu. per hour will require a compressor 24/16 times as great in capacity for 16 hours operation.

$$33{,}800 \times \frac{24}{16} = 57{,}000 \text{ Btu. per hour.}$$

This means the evaporator coil must also be capable of removing 57,000 Btu. per hour and it would have to be $970 \times \frac{24}{16} = 1{,}450$ lineal feet of ⅞ tube.

In all probability you should have figured the amount of milk to be cooled and taken that as the load. Aeration would warm the brine some but not to room temperature every day. If the brine temperature increases 10° during circulation, then only 1/6 as much capacity and coil will be required.

With the above figures I am sure you will be able to verify the capacities you have chosen.

CRANKSHAFTS BREAK REPEATEDLY

QUESTION 777: We have a York ammonia machine which we seem to have crankshaft trouble with. I will describe the machine in full and with this information you will probably be able to help us.

To start with this machine was installed by a York man in 1932 or 1933, since then four crankshafts have broken. Each time a different serviceman installed the new shaft. The last one was installed by me.

The first three shafts broke between number one and number two journal. The last one broke on number two journal (number two being farthest from flywheel). The last shaft was installed October, 1945 and broke October, 1946—just run one year.

I have been checking and keeping the proper oil level at all times. Very little liquid ammonia reaches the machine. When I installed the shaft I also installed all new bearings. The crankshaft seemed to turn free at all points. The speed of this machine is about 480 rpm. Flywheel size is 36 inches diameter, motor pulley size 10 inches diameter, speed of motor 1725 rpm. The machine has an oil pump which pumps oil to all the bearings. This pump has never failed during the last year, none of the bearings ever run warm and the connecting rods have never run loose. The number two discharge valve has stuck

open once during this 12 month period and this was caused by a poor fit on the valve. I machined the valve down to the proper fit and it seems to work alright. This machine is bolted down on a concrete slab which seems to be level.

Is it possible that the machine housing itself is slightly out of line? If so, the bearings would not stay tight this long, would they? Is it possible the machine is running at too high a speed? Would liquid returning have any affect on the shaft? Would stuck valves cause the shaft to break?

ANSWER: The information given here indicates that there has never been a lubrication failure in this machine so that lack of lubricant could be eliminated as a possible source of the difficulty.

It also states that at the time the last crankshaft was installed new bearings were also installed throughout the machine. This is a desirable practice since the installation of a new crankshaft in an old set of bearings may result in misalignment and damage to the crankshaft at a later date. Of course the bearings must be properly fit to the shaft at the time the installation is made.

Stop Liquid Pumping

There is an indication that the compressor is subject to liquid pumping at times since it is stated that "very little liquid ammonia reaches the machine." We wish to emphasize the fact that liquid pumping regardless of the quantity or frequency should be avoided since this condition can result in a lack of lubrication to the cylinder walls or could produce a shock to the moving parts of the compressor resulting in mechanical damage.

The one other point to be noted is the fact that the compressor is bolted down on a concrete slab which is assumed to be level. The setting of the compressor on the concrete slab should be definitely checked since if the compressor is not properly leveled strain from the foundation bolts may have thrown a twist into the crankcase of the compressor and produced misalignment. Such a condition would definitely result in crankcase failure eventually. The alignment of the two mains and the outboard bearings may be checked by making up a long straight mandrel of the diameter equal to the crankshaft bearing area diameter and passing it through all three bearings at the same time.

This compressor should be thoroughly checked since it is apparent that the repetition of failures is due to some existing local condition which must be eliminated.

UNIT BOUNCES

QUESTION 778: I have a problem on which I would like some information. I was called to service a Universal unit for jumping around. This is a 1/6 hp. household unit with the trade-name of Alliance. It has a 1½ lb. charge of F-12. The whole box shakes all over the place. It has an automatic expansion valve Detroit 673. Head pressure is 105 lbs. per sq. in. and back pressure is 7 lbs. per sq. in. It does not pound in the head and freeze all right. No air in the system. It runs very quietly and the only complaint is the shaking. Can it be that the springs on which the unit rests are not the proper tension? Just what am I neglecting to check, if anything? Can you help me out? Room temperature was 70° F. and box has plenty of air space all around.

ANSWER: Most probably the cause of the Universal unit bouncing on its mountings is a worn and bumpy belt. This would be evidenced by some slack in the belt which will be vibrating considerably in the space between pulleys.

Another possibility is that the belt is slipping, permitting the compressor to run too slow. It is possible, of course, that the spring mountings are in need of replacing, but this is rather doubtful unless the springs have been replaced at some time with the improper size.

High head pressure will often cause bouncing of the unit, but the pressure you have indicated is not high for this particular unit and the refrigerant being used. Too much tension on the discharge valves could possibly cause the trouble, although it is doubtful that there would be so much additional tension on these valves to cause such trouble. I think that the belt will be the answer to your problem.

X X X

NEED FOR REFRIGERATED TRUCKS

AT THE close of 1941, there were only 27,100 refrigerated trucks in service in the United States, only a fraction of one per cent of the total trucks with direct mounted bodies. In the trailer classification, there were only about 4,700 refrigerated vehicles, and today there is said to be an immediate need for 4,000 more refrigerated trailers. So great is the demand for refrigerated transportation that even automotive trade papers are urging truck and trailer manufacturers to cultivate this market.

SERVICE POINTERS

A department for the exchange of ideas on new devices and methods of improving service work. Five dollars is paid for each pointer published. Write up your idea today and mail it to the Service Pointer Editor.

SHOT OF WHISKEY FOR REFRIGERATOR

DESPITE all that the ladies of the W.C.T.U. say about whiskey, J. M. Lutz, refrigeration engineer of the Lutz Refrigeration Co. of Cleveland, Ohio, is inclined to disagree with these ladies. One of his service men has discovered that whiskey, yop, the demon whiskey, has a place in none other than the refrigeration industry as a first class pinch hitter.

It all happened two years ago when this firm received a service call from a Cleveland residence at eight o'clock at night. In the home where the service was needed there was sickness which made it imperative that the refrigerator function properly. When the service man called at this home he found there was moisture inside the refrigerator at the expansion valve. He had no methol alcohol with him and several efforts to get a little completely failed. He realized that the unit must be serviced if humanly possible so he decided to try a little experiment.

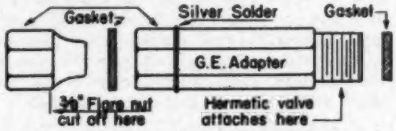
The service man asked if there was any good whiskey in the house and was informed that there was. A partly filled bottle of 100% whiskey was promptly produced, whereupon the service man put a tablespoonful of it in the liquid line, right at the expansion valve. Immediately, as if by magic, the moisture disappeared. That happened two years ago. Today the unit is still functioning perfectly and has had no need for further servicing. The whiskey did a good job.—*By Stephen P. Lathrop.*

\$ \$ \$

LATE MODEL METER MISER CHARGING VALVE

IN THE later models of the Frigidaire Meter Miser unit the evacuation and charging of this unit was done by the factory through a special fitting located off the suction line strainer at the unit. The hermetic purging and charging valve kits on the market do not have an adapter which fits this type of connection and none are available from the Frigidaire factory. To overcome this I have improvised one very simply and it works like a charm.

Take an ordinary ⅜" flare nut and cut off the neck close to the body of the nut. Soft solder (or silver-solder for permanency) this to the G.E. adapter supplied with your hermetic valve kit. This is an adapter about 2" long and is made to fit the G.E. Model CG1-A16.



The purge screw on the special unit fitting has a ⅜" hexagon head and as none of the adapter wrenches in the hermetic kit fit this, it is a simple matter, with a hacksaw, to cut a screw driver slot in the hexagon head.

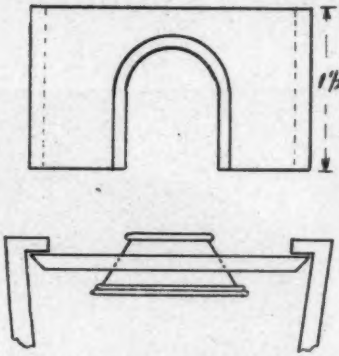
To use: 1. Place a fibre or copper gasket against the unit fitting. 2. Screw the "new" adapter tightly up against the gasket. 3. Attach the hermetic valve as with any other unit and the job is complete.—*Submitted by R. Robinson, Brooklyn, N. Y.*

\$ \$ \$

OIL THROWER PULLER

I AM submitting a sketch of a "jigger" I made and have been using for several years for pulling the oil thrower on a Delco motor armature shaft. I used about two and one-half (2½) inches of an automobile spring leaf, drilled a three-quarter (¾) inch hole in the center, cut the slot beveled, and also beveled the ends as I have tried to illustrate on the sketch. Used with a small gear puller this makes a simple job of pulling said oil thrower.

As a slight improvement over Joe Hartinger's Service Pointer in the August, 1946, issue, I have been using a discarded non-refillable dehydrator shell approximately two



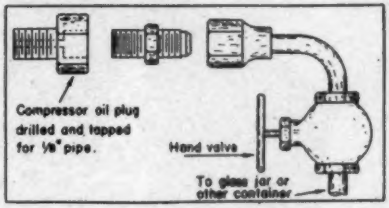
inches in diameter and about four inches long for adding compressor oil. The advantage being that it is sturdier than the funnel and has a screen in the bottom. Also when used with a testing manifold, the hand valve is unnecessary. It is also unnecessary to solder the tubing as a quarter (¼) inch flare connection can be used.—*Submitted by A. W. Jones, Bridgeville, Pa.*

* * *

REMOVING EXCESS OIL

EVERY serviceman knows that removing excess oil from compressors is quite a chore. On some jobs like the Frigidaire E-4 it is particularly messy. To drain excess oil from this job I made the following gadget:

Use a bolt similar to the oil level bolt except with a larger head. Drill a ⅛" hole through the bolt. Counterbore the head, and thread for ⅛" I.P. Attach a ⅛" I.P. x ¼" flare union to the bolt. Reduce crankcase pressure to one or two pounds. Replace the regular bolt with the one described, being sure to use a copper washer under the head. Attach copper tubing and a hand valve as shown in the sketch. Tube should be at the bottom of a glass jug. Crack suction service valve and open hand valve and drain excess oil. Close hand valve. Open both



service valves and operate compressor. Listen carefully for any change of tone in the machine which might indicate excess oil in the crankcase, at first sign stop the compressor for a few moments, then open hand valve and drain accumulation of excess oil from crankcase. When bubbles appear in the jug close hand valve and again put the machine into operation. Repeat above until all excess oil has been returned to and removed from the crankcase.—*Submitted by M. E. Smoyer, Kansas City, Kan.*

* * *

AIR can be dried or moistened in exactly the same way—by blowing it through water sprays. The big difference is in the temperature of the water, the chilled variety serving to dry it, while warm water sprays raise the humidity to a comfortable level.

"... and now I will demonstrate this wonderful freezer for you."

Installing a TRAP-IT
...improves Refrigeration System

TRAP-IT

Refrigeration Parts Jobbers stock the A-P "TRAP-IT" in 3 sizes — for systems of 1 ton, 2 tons and 4 tons Freon capacity, or double this capacity in Methyl Systems. Put A-P "Trap-It" to work for your benefit now.

Give your customers an extra "guarantee" against common troubles! Install an A-P "TRAP-IT" Filter-Strainer on *any* refrigeration system, new or old. You'll save yourself many extra callbacks, and avoid many minor service difficulties.

A "TRAP-IT" quickly removes dirt, solder particles, scale, and gummy deposits—impurities which too often result in sticky and clogged valves and other system troubles. The A-P "TRAP-IT" is as effective as a 900-mesh strainer—yet it offers *no appreciable pressure drop.* Starts cleaning up your refrigeration system immediately—for smoother valve operation and system efficiency.

AUTOMATIC PRODUCTS COMPANY

2484 NORTH THIRTY-SECOND STREET • MILWAUKEE 10, WISCONSIN

EXPORT DEPT. • 13 E. 40TH ST., • NEW YORK 16, N. Y.

ap Dependable REFRIGERANT VALVES

STOCKED AND SOLD BY GOOD REFRIGERATION JOBBERS EVERYWHERE . . . RECOM[illegible] OF LEADING REFRIGERATION SERVICE ENGINEERS

Dimension Standards for Small Motors

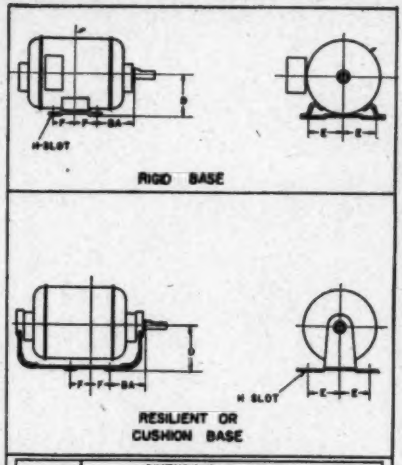
Motors 1/20 Through ¾ Horsepower to be Built in Three Standardized Frames. Standardized Dimensions Will Eliminate Initial Application as Well as Replacement Difficulties Now Encountered.

By J. L. McKINLEY *

A BROAD new program of standardization for fractional-horsepower motors was announced early in September of this year by members of the Motor and Generator Section of the National Electrical Manufacturers Association. At that time, the initial or basic standard providing a specific method of defining motor rating and performance in coordinated terms of horsepower, speed, breakdown torque and service factor was announced. This basis of rating standard was established in order to eliminate initial application difficulties and to insure proper performance and long life insofar as the electrical characteristics of the motors are concerned.

Although the specific basis of motor rating will be a key factor in obtaining maximum efficiency by both users and manufacturers of fractional-horsepower motors, its principal value results from the fact that machinery or appliance manufacturers can obtain proper motors from all suppliers without having to continually go through exhaustive engineering tests for each application or make of motor. A standard basis of rating cannot, by itself, eliminate many of the costly difficulties encountered by those who design machines and apply motors to them. Neither can it alone help users of these machines who must service and maintain them with a minimum of expense and loss of productive time. A greater portion of the actual manufacturing and service replacement difficulties with motor driven machines and devices are of a mechanical nature.

The great variation in mounting dimensions and overall size of motors of different makes has been of no little concern to the machinery manufacturer, user and service man. To provide for the use of two or three makes of motors in one design of machine, many universal mounting bases, adapter plates and other arrangements have been devised by machinery manufacturers. On the other hand, motor manufacturers have many time supplied mounting bases and endplates different from their own in order to properly adapt their motor to a machine already designed for some other make of motor. This resulted in high costs of tooling and loss of production time. Similar difficulties are experienced by users attempting to replace a motor of one make with that of another make and still obtain satisfactory performance and dependability from the motor-driven device.



FRAME NUMBER *	DIMENSIONS IN INCHES				
	D	E	F	BA	H
42	2 5/8	1 5/8	5/32	.2	5/32 SLOT
56	3 1/2	2 7/8	1 1/2	2 3/4	9/32 SLOT
66	4 1/2	2 15/16	2 1/2	3 1/8	13/32 SLOT

* FRAME NUMBER SYSTEM IS PROPOSED. SEE DISCUSSION OF "STANDARD FRAME NUMBERS."

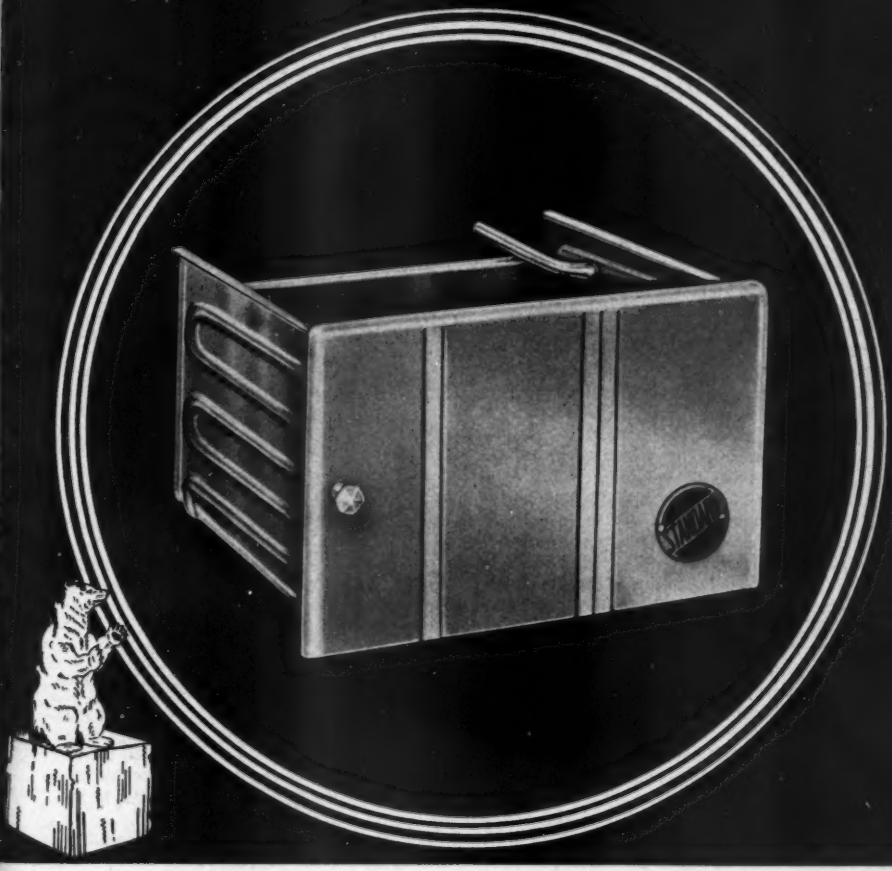
FIG. 1.

New Dimension Standards

Realizing the savings to be gained by machinery manufacturers, motor manufacturers and users, NEMA also initiated the study of dimension standards in 1944. After two years of work, these standards have been adopted. The new dimension standards provide for three motor frame sizes with dimensions shown in Fig. 1. At the present time, no horsepower and speed ratings will be assigned to these frame sizes.

* Wagner Electric Corp., St. Louis, Mo. and Member of the Fractional-Horsepower Subdivision of the Motor and Generator Section of NEMA.

STANDARD EVAPORATORS



Announcing . . . **DOUBLE-WIDTH EVAPORATORS**

SOLD THROUGH LEADING REFRIGERATION WHOLESALERS

Standard Refrigeration Company

The Line of Quality

20 NORTH WACKER DRIVE **CHICAGO 6, ILLINOIS**

As indicated in Fig. 1, the dimensions apply to both rigid and resilient or cushion base motors. These dimensions apply to motors 1/20 through ¾ hp, 1800 rpm (1 hp, 3600 rpm). The "H" dimension of 13/32-inch slot and "BA" dimension of 3⅛ inches in the largest frame has been established for the purpose of matching the integral horsepower 203 frame (1 hp, 1800 rpm) which has an "H" dimension of 13/32-inch hole, and "BA" dimension of 3⅛ inches. This will provide for interchangeability on belt driven machines, using both fractional- and integral-horsepower motors.

Standard Frame Numbers

Each motor manufacturer now has a separate and distinct system of frame designations. Some manufacturers employ numbers, some letters, and others a combination of both to designate the various motor frame sizes.

In order to make the new dimension standards more useful and effective, a standard system of numbering frames has been proposed. This proposed system has been modeled after the integral-horsepower system which employs frame sizes 203 through 505. Those associated with the application and use of integral-horsepower motors would be the first to give their approval for a similar system for numbering fractional frames because of the great success of the former which has been in use for approximately 16 years.

In the proposed system for numbering the frames, the frame number will be 16 times the shaft height (D dimension). By referring to Fig. 1, it will be noted that the three frames will be 42, 56 and 66. The BA, E, F and H dimensions will be constant for any given "D" dimension or frame size. Suffix letters will be used to indicate the same features now indicated in the integral system, and, therefore, the same frame numbers with proper suffix letters (when assigned) would be used for vertical and flange motors as are designated for the horizontal motors of corresponding sizes. Individual manufacturers may use any letter preceding the frame number, but such a letter would have no reference to standardized dimensions. For example, a number 66 frame might be designated as "66" by one manufacturer and as "A66" by another manufacturer, but the D, BA, E, F and H dimensions of both frames will be identical and will be the values shown in Fig. 1.

STRIKE CURTAILS "FREON" SUPPLY

ACCORDING to officials of Kinetic Chemicals, Inc., a strike now in progress at the plant of their main supplier of carbon tetrachloride creates a shortage of this basic raw material which, in turn, will make it necessary for Kinetic to curtail the production of "Freon-12." Some carbon tetrachloride now on hand and more in transit to Kinetic Chemicals, Inc., will probably be sufficient to permit production at approximately 75% of capacity during the month of December. After that time, should the strike continue, production will be curtailed to about 20% of capacity.

According to Kinetic Chemicals, Inc., should the strike continue after December, production schedules will have to be based on the amount of carbon tetrachloride secured through other sources of supply, and the 20% of capacity will be all that can be maintained. The problem of keeping essential refrigeration equipment for the preservation of foods in operation is an extremely important one and Kinetic, as well as others in the industry, will find it necessary to see that "Freon-12" is used only for the most important purposes.

BOOK REVIEW

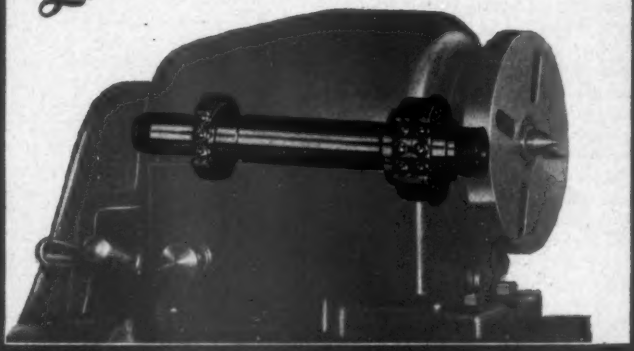
ESTABLISHING AND DEVELOPING A REFRIGERATION SERVICE BUSINESS. Published by Nickerson & Collins Co., 433 N. Waller Ave., Chicago 44, Ill. 112 pages. Price $1.50.

This book is designed as an aid to the refrigeration service engineer starting his own business, or to the man who wishes to develop his business.

The book is divided into five main sections; the first section—Requirements of Owning Your Own Business or Working for Others; second section—Planning Your Shop; Third—Your Business Policy, Office Routine, Accounting and Service Rates; Fourth—Selling Your Services, Plans of Action; and Fifth—Selling Merchandise Through Service.

Included under the sections is such valuable information as a suggested apprentice-

Logan A NAME TO REMEMBER WHEN YOU THINK OF BETTER LATHES



BALL BEARING SPINDLE MOUNTING

PERMITS HIGHER CUTTING SPEEDS . . . REQUIRES NO BEARING ADJUSTMENT . . . SUSTAINS ACCURACY OF LOGAN LATHES

Quick Change Gear Cabinet Lathe

SPECIFICATIONS COMMON TO ALL LOGAN LATHES . . . swing over bed, 10½" . . . bed length, 43⅛" . . . size of hole through spindle, 25/32" . . . spindle nose diameter and threads per inch, 1½"—8 . . . 12 spindle speeds, 30 to 1450 rpm . . . motor, ½ hp, 1750 rpm . . . ball bearing spindle mounting . . . drum type reversing motor switch and cord . . . precision ground ways, 2 V-ways, and 2 flat ways.

With its spindle turning on a pre-loaded ball bearing mounting of extreme precision, the Logan Lathe is inherently well adapted to accurate work at higher spindle speeds. This fact permits the use of high speed carbide cutting tools to full advantage. It assures a minimum of spindle deflection. And since no bearing adjustment is required within the full range of its speeds, 30 to 1450 rpm, the accurate factory alignment of the Logan Spindle remains undisturbed, and original accuracy is sustained. Grease sealed, the Logan Spindle Mounting never needs lubrication. All these characteristics are important factors in the proved ability of Logan Lathes to speed output and cut costs on production lines, and to do fast, accurate work in the tool room. See your Logan Lathe dealer, or write direct for the Logan Lathe catalog. M-2-M

LOGAN ENGINEERING CO. CHICAGO 30, ILLINOIS

ship schedule and apprenticeship agreement, which can be used by the service shop undertaking the training of apprentices; a very general explanation of credit and financing set-ups in the service business; estimating the value of a business where you wish to purchase an established one; advantages of buying; and some of the general outlook for the future service business.

There are shop layouts; suggested equipment needed in a shop; and some practical test devices which you may find impossible to buy but practical to make.

Under business policy and office routines is a thorough description of a very practical accounting system, together with all the suggested service forms needed in the business. A choice of several service order forms are provided from which your own can be arranged. How to determine your service rates and a table of average service rates charged in all the states and principal cities of the United States is given for comparison with your rates.

A general description of selling methods used in selling services, together with some practical plans of action, make up the Service-Sales section. Under it are several suggested service contract plans with some idea of what contract rates are charged; suggested contract forms for household units, commercial refrigeration and apartment multiple systems are provided.

COLDSPOT FREEZER

(Continued from page 40)

little as 2° difference has been obtained between coil temperature and cabinet air. An accumulator on the 6 cu. ft. coil allows for a small variation in the charge. Inlet and outlet connections are made in the valve box (see Fig 6).

Refrigerant Charge

The 6 cu. ft. charge is critical. This means that there is an optimum charge at which best performance results, and any appreciable variation from this charge will affect performance. This is due to the capillary tube type of system employed. The charge is 15 oz. plus or minus 1 oz.

The 9 cu. ft. model is charged with 2 pounds, and the 12 and 18 cu. ft. with 3 pounds of refrigerant. This is considerably in excess of the minimum required to operate the system.

GETTING DOWN TO BUSINESS

(Continued from page 43)

advertising where you catch the "boy-meets-girl, boy-marries-girl" theme.

Now what motivations could conceivably concern so "emotionless" a matter as refrigeration service? For one thing, comfort. A refrigerator that is out of order in the home causes considerable discomfort to the wife. In a commercial installation, as in a grocery store, an ailing refrigerator may mean loss of a certain amount of business—here, appeal would be made perhaps through the human drive we have labelled "security". The so-called appeal to the pocketbook—which is usually a smart approach in advertising—is substantially a phase of the human desire for security.

Thus, the introduction of "copy" playing up to comfort or security would be a logical appeal. To the domestic user, you might point out the discomfort resulting from a breakdown of a refrigerator and the cost involved. You could add the point that the precaution of an inspection by an expert might avoid later trouble and might catch and correct inefficient operation and "nip it in the bud."

To the commercial user to whom you mail a letter series (note that word SERIES) you might enlarge on the idea that "an ounce of prevention is worth a pound of cure." An inspection now, by an expert technician, would be security against heavy cost and inconvenience later. Perhaps you may choose to offer the inspection free—some refrigeration service men starting out do just this—but many others feel that prospects and customers the world over attach little value to anything FREE. This, incidentally, is also the opinion of your columnist.

Interest then is a matter of bridging your attention-getting device into your actual message. It is the build-up to establishing desire on the part of your prospect. Bear in mind, however, that although all of these basic ingredients of good copy should be present in an advertisement, they need not be clearly defined. One may lead into the other; interest, for instance, may be created through the headline or the illustration themselves.

Even columnists are limited to space, so next issue we'll discuss the other two major points: desire and action—along with the presentation of full advertisements and letters.

Laboratory Control Insures Purity of "Freon"—Helps Cut Maintenance Costs in Air Conditioning and Refrigerating Systems

The trained laboratory technician above is making volumetric analyses that help insure the efficient, trouble-free operation of refrigerating systems in which "Freon" safe refrigerants are used.

By titrating samples withdrawn from different parts of the "Freon" plant, the purity—both of raw materials and of "Freon" itself—is controlled and maintained. Each analysis *must* conform to rigid specifications, and purity is the password. This is but a small part of the huge control program that guarantees the quality and uniformity of *all* "Freon" refrigerants.

"Freon" refrigerants *are* pure. They are free from acids, insoluble gases and are almost totally dry—less than 25 parts of moisture in a million parts of "Freon"! These important properties of "Freon" safeguard modern, compact equipment . . . protect intricate, precision-made parts against corrosion, oxidation or other damage which leads to costly shutdowns and repairs.

When you plan air conditioning or refrigerating installations for commercial or industrial purposes or the frozen foods field, be sure to specify equipment designed to utilize "Freon" safe refrigerants. For further information about "Freon" safe refrigerants, write our Sales and Engineering Departments, Kinetic Chemicals, Inc., Tenth and Market Sts., Wilmington 98, Delaware.

IMPORTANT FEATURES OF "FREON" SAFE REFRIGERANTS

1. **Freedom from moisture . . . less than 25 parts per million.**
2. **Narrow boiling point range—confined within limits of 1/2°C.**
3. **Less than 2% of insoluble gases in vapor phase.**
4. **Freedom from acids. There are none in "Freon".**
5. **Freedom from impurities . . . less than 1/20 of 1%.**

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FREON

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safe refrigerants

"Freon" is Kinetic's registered trade mark for its fluorine refrigerants and propellents.

Refrigeration Service Engineers Society

Official Announcements of the activities of the International Society and Local Chapters appear in this department as well as articles pertaining to the educational work of the Society.

INTERNATIONAL HEADQUARTERS:
433-435 North Waller Ave., Chicago 44, Ill.

NEW ENGLAND STATES ASSOCIATION ANNUAL MEETING

THE New England States Association met November 17th at the Hotel Narragansett, Providence, R. I. It was a very successful meeting with approximately 400 in attendance. Registration began at 10 A.M., with a business meeting opening at 11 A.M. William E. Tierney, President, gave the address of welcome. Theodore I. Glou, President of REWA, addressed the meeting, congratulating the organization on its growth and the fine meeting they were enjoying. Various business reports were received and Paul B. Reed, Chairman of the International Educational Committee talked on the educational program. A banquet was held during the day and immediately afterward door prizes were drawn, consisting of a wrist watch, a set of tumblers, a pen and pencil set, ties for the men, nylons and boxes of candy for the ladies. There were approximately 25 or 30 prizes.

The election of officers followed the dinner, with all the former officers being elected with the exception of Jerry Handspicker who asked permission to withdraw because of the press of business. The officers are: William E. Tierney, Worcester, *President;* Arthur W. Andreen, Hartford, *1st Vice-president;* John Madden, Hartford, *2nd Vice-president;* Lee J. Wallace, New Haven, *Secretary;* George Martin, Providence, *Treasurer;* and Walter E. Quimby, Springfield, *Sergeant-at-Arms.* Richard Chase was elected *Chairman of the Educational Committee.*

* * *

MICHIGAN STATE ASSOCIATION FORMATION MEETING

ON October 21st in Owosso, Mich., at the Owosso Hotel, representatives of chapters in the state of Michigan met in their first annual meeting for the purpose of forming the Michigan State Association. Officers who were elected at this meeting are: Einer H. Hanson, Flint, *President;* R. Kellogg, Lansing, *Vice-president;* Leslie Lockwood, Lansing, *2nd Vice-president;* Charles H. Earl, Bay City, *Secretary;* C. A. Babcock, Flint, *Treasurer;* and Floyd Kithcart, Lansing, *Sergeant-at-Arms.*

In the views taken at the recent Michigan State Association formation meeting, are top—the three Charlie Earls in attendance at the meeting. Left to right, they are Charlie Earl of the Alpha Electric Co. of Detroit; Charlie Earl, also of the Alpha Electric Co., father of the first Earl; and Charlie Earl of the Earl Refrigeration Co., Bay City, Secretary of the Michigan State Association. Below is a view of the dinner held during the session.

About 40 members were in attendance at the meeting, which included an educational program. Paul B. Reed, International Educational Director, was the speaker of the program on the subject "Motor Loading." A dinner was held in the evening with about 60 in attendance. An unusual incident of the evening was the presence of three men by the name of Charlie Earl, which caused considerable confusion among those in attendance, much to the delight of the Earls'.

* * *

C. C. STUMPF OPENS BUSINESS IN CALIFORNIA

CLARENCE C. STUMPF, formerly a member of Tri-County Chapter RSES, residing in Aurora, Ill., and Vernon E.

Safe Refrigeration

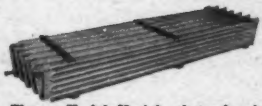
builds more customers for cabinet manufacturer

The new Kold-Hold factory. From it, in steady flow, come those adaptable, flat, tubeless refrigeration plates. In locker plant space cooling, for stands, banks, shelves . . . or in refrigerated trucks, efficient flat Kold-Hold evaporator type plates give satisfaction through superior performance. This Company* has another use . . . the liner cooling unit in frozen food cabinets.

This is a happy grocer. He has solved the problem of displaying packaged frozen foods. His supply rests in a 20 cubic foot storage compartment, completely lined with one Kold-Hold Liner. Angled mirror displays entire line to customers . . . packages are stored at safe temperatures below the black border.

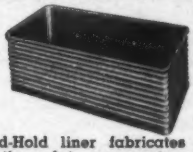
This is a happy shopper. The cabinet with the Kold-Hold liner permits her to walk right up to the display. When she makes her purchase, she gets a crisp, dry package, cool to the touch, with contents properly temperatured . . . cold enough to hold until it's transferred to her own home locker or refrigerator.

*Name of mfg. on request.

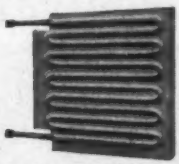


These Kold-Hold plate bank units are suspended from the ceiling, replacing cumbersome pipe coils, providing constant, economical temperature.

Kold-Hold serpentine plate stands are designed for sharp freezing and holding. Plate stands are connected in series.



Kold-Hold liner fabricates serpentine plate evaporators into one unit, eliminating refrigerant joints, giving uninterrupted flow.



Single Kold-Hold plates can be obtained in practically every size and adapted to an amazing number of uses.

Kold-Hold "Hold-Over" truck plates create greater pay load space . . . cold is built up at night and holds desired temperature for the day's run.

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KOLD-HOLD MANUFACTURING CO.

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Denny have published a certificate that they are conducting business under the firm name of Foothill Commercial Refrigeration at 680 Citrus Avenue, Azusa, Calif.

NEW CHARTERS PRESENTED

PENINSULA CHAPTER, Newport News, Virginia—At the third meeting held by this chapter on November 14th, the charter was presented by International Director W. Booth. The meeting was a colorful one, during which all members were given the oath of membership and the charter presented to George Blount, 1st Vice-president, in the absence of the chapter's President. Mr. Booth followed his presentation with an address explaining the objects of the Society. The meeting took the form of a dinner meeting and there were a number of distinguished guests from other chapters present.

PENSACOLA CHAPTER, Pensacola, Florida At a dinner meeting held November 15th in Pensacola, 35 members present witnessed the presentation of the chapter's charter by International Director C. S. Tucker. The presentation ceremony was followed by the election of officers, and those elected were: W. E. Carter, *President;* H. R. Hardy, *1st Vice-president;* Foy B. Gilmore, *Secretary-Treasurer;* and Allen Cotton, *Sergeant-at-Arms.*

Officers and committeemen in the recently organized Alabama State Association. Seated is J. M. Manley, President. Standing, first row, left to right, are: G. W. Elliott, Mobile; C. S. Tucker, Birmingham; W. C. Kent, Birmingham; Robt. Gennett, Birmingham; S. B. Goodwin, Montgomery; J. M. Gantt, Montgomery; and J. B. Harris, Montgomery. Second row: W. L. Anderson, Mobile; C. R. Pettus, Mobile; E. L. Merrill, Birmingham; J. A. Robertson, Mobile; and R. M. Bedsole, Montgomery.

The Alabama State Association was organized September 15, at which time a resolution was passed to the effect that the association be formed. Formal application for charter was immediately made to the National Society. Presentation of the charter was made at the annual meeting held December 2, 3 at the Whitley Hotel in Montgomery, Ala.

Educational Sound Films Schedule of Showings

UNDER the supervision of the International Educational Committee, a set of 16 sound films, grouped into 12 showings and accompanied by a set of slides, are being circulated among chapters as a part of their educational program. Films are all of a practical nature on servicing refrigerating systems. Titles of the films and their identifying numbers and the schedule of showings are listed.

Film Titles and Key Numbers

No.	TITLE
360	Principles of Refrigeration
438	Checking The System—Part I
439	Checking The System—Part II
440	Locating and Repairing Leaks
441	Adding or Removing Refrigerant
442	Removing and Installing A Compressor or Condenser
443	Removing and Installing A Cooling Unit
444	Adjusting and Checking The Expansion Valve
445	Checking and Replacing A Float Valve
446	Checking The Electrical System
447	Quieting A Noisy Refrigerator
448	Adjusting and Repairing The Thermo-Expansion Valve
451	Servicing Water Cooled Condensers
449	Adjusting Pressure Actuated Temperature controls
450	Adjusting Commercial Thermostatic Controls
452	Making and Repairing Tubing Connections

SCHEDULE OF SHOWINGS

AKRON, OHIO—Akron Chapter: January 8—No. 442. Contact Claude L. Wall, 23 Grand Ave., Akron 2, Ohio.

AURORA-ELGIN-JOLIET, ILL.—Tri County Chapter: January 18—No. 448-451. Contact William J. McCarley, 607 N. Center St., Joliet, Ill.

BALTIMORE, MD.—Monumental Chapter: January 8—No. 442. Contact Mr. George J. Roche, Roche & Hull Appliance Corp., 1029 Cathedral St., Baltimore 1, Md.

BATON ROUGE, LA.—Louisiana Chapter: January 3—No. 448-451. Contact Mr. A. E. Kaiser, Sr., Acme Refn. Service Co., 1670 North St., Baton Rouge, La.

CHARLESTON, W. VA.—Charleston Chapter: January 14—No. 360. Contact H. G. Frame, 1105 Washington St. W., Charleston 2, W. Va.

CHICAGO, ILL.—Chicago Chapter: January 14—No. 449-450. Contact D. D. Orr, 332 S. Hoyne Ave., Chicago, Ill.

CLEVELAND, OHIO—Cleveland Chapter: January 14—No. 443. Contact Robert Whitney, % Williams & Co. Inc., 3700 Perkins Ave., Cleveland 14, Ohio.

COLUMBUS, OHIO—Columbus Chapter: January 8—No. 449-450. Contact H. Grossman, 22 W. Naghten St., Columbus, Ohio.

DAVENPORT, IOWA—Mississippi Valley Chapter: January 7—No. 452. Contact J. Vinje, 529 W. Second St., Davenport, Iowa.

AIRSERCO'S famous
THERMOSTATIC CONTROL TESTER

Detects thermostatic control defects without removing the control from its cabinet

Save blind tampering with thermo controls and eliminate guesswork with this time-and-labor saving device. The only instrument of its kind now approved as standard in the refrigeration service field.

AIRSERCO THERMOSTATIC CONTROL TESTER is now a 'must' for the shop and service man. It attaches by means of a quick connector to any small refrigerant service cylinder—uses for its operation Liquid Methyl Chloride, or Freon F-12. This handy chrome plated pocket-size instrument services ALL makes of thermostatic controls. ★Quickly indicates cut-out and cut-in temperatures and detects ANY defect without removing the control from the cabinet. ★Comes complete with pocket case, bulb adaptor and temperature chart.

Model A100.....$19.50

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DAYTON, OHIO—Dayton Chapter: January 9—No. 452. Contact R. E. Warner, % Allied Supply Co., 359 W. Monument Ave., Dayton, Ohio.

DENVER, COLO.—Mile High Chapter: December 16—No. 448-451. Contact R. C. Kimmel, 1524 15th St., Denver 17, Colo.

DULUTH, MINN.—Head of the Lakes Chapter: January 6—No. 443. Contact C. A. McCafferty, 7 N. 29th Ave. W., Duluth, Minn.

EVANSVILLE, IND.—Evansville Chapter: January 2—No. 447. Contact C. E. Goad, 11 Main St., Evansville, Ind.

FLINT, MICH.—Motor City Chapter: January 14—No. 443. Contact Mr. Dave Fortune, 413 North Chevrolet Ave., Flint, Mich.

FORT WORTH, TEXAS—Cow Town Chapter: January 9—No. 447. Contact P. D. Cato, Texas Refn. Supply Co., 1410 Commerce St., Fort Worth, Texas.

FRESNO, CALIF.—Fresno Chapter: January 9—No. 445. Contact N. N. Leas, % Cond. Air & Refn. Co., 249 N. H St., Fresno 3, Calif.

GRAND RAPIDS, MICH.—Furniture City Chapter: January 7—No. 449-450. Contact M. D. Thiebout, % Consumers Power Co., 450 Market St. S. W., Grand Rapids, Mich.

HARTFORD, CONN.—Central Conn. Chapter: December 30—No. 442. Contact Stanley H. Baldwin, % Joseph Simons Co., 271 Sheldon St., Hartford, Conn.

HUNTINGTON, W. VA.—Tri State Chapter: January 14—No. 448-451. Contact A. W. Albertsen, 314 11th St., Huntington 14, W. Va.

INDIANAPOLIS, IND.—Indianapolis Chapter: January 14—No. 442. Contact J. A. Salter, 3623 E. Michigan St., Indianapolis, Ind.

JACKSON, MISS.—Magnolia Chapter: December 30—No. 443. Contact A. E. Shafer, P. O. Box 1509, Jackson 112, Miss.

LA CROSSE, WIS.—La Crosse Chapter: January 3—No. 443. Contact George Brenstein, 408 Copeland Ave., La Crosse, Wis.

LANSING, MICH.—Wolverine Chapter: December 23—No. 449-450. Contact R. Kellogg, 616 Jessop Ave., Lansing, Mich.

LIMA, OHIO—Lima Chapter: December 19—No. 443. January 16—No. 445. Contact Allied Supply Co., Attn. Dan Shively, 122 S. Union St., Lima, Ohio.

LOGAN, UTAH—Utah Aggie Chapter: January 7—No. 360. Contact J. Cecil Sharp, % Utah State Agricultural College, Logan, Utah.

LONG BEACH, CALIF.—Long Beach Chapter: January 8—No. 446. Contact Van's Supply, 250 E. 12th St., Long Beach, Calif.

LOUISVILLE, KY.—Colonels Chapter: December 19—No. 449-450—January 16—No. 440-441. Contact J. M. Berry, % F. H. Lagsenkamp Co., 339 W. Main St., Louisville 2, Ky.

MARION, IND.—Central Indiana Chapter: December 18—No. 442. Contact Francis Holloway, 704 Whites Ave., Marion, Ind.

MEDINA, OHIO—Medina Chapter: January 13—No. 443. Contact Orra Nichols, Jr., Nichols Elecl. Equipment Co., Route 1, Medina, Ohio.

MIAMI, FLA.—Greater Miami Chapter: December 26—No. 444. Contact Orville W. Brown, 1044 N. W. 65th St., Miami 38, Fla.

MONTEREY, CALIF.—Monterey County Chapter: January 8—No. 444. Contact Robert Hall, % Tice Electric Co., 500 Del Monte Ave., Monterey, Calif.

MONTGOMERY, ALA.—Montgomery Chapter: December 16—No. 447. Contact W. C. Goodwin, 8 Forest Ave., Montgomery, Ala.

NEW HAVEN, CONN.—Elm City Chapter: January 3—No. 448-451. Contact T. B. Howell, United Illuminiating Co., 221 George St., New Haven, Conn.

OMAHA, NEBR.—Missouri Valley Chapter: December 19—No. 445. January 16—No. 446. Contact C. M. Flohr, % United Motors Service, 27th Ave. & Harney St., Omaha, Nebr.

PEORIA, ILL.—Illinois Valley Chapter: January 10—No. 446. Contact Bryson Roth, 300 S. Washington St., Peoria, Ill.

POMONA, CALIF.—Orange County Chapter: December 19—No. 443. January 16—No. 444. Contact R. L. McCain, 615 E. Bishop St., Santa Ana, Calif.

PORTLAND, ORE.—Multnomah Chapter: December 19—No. 444. January 16—No. 445. Contact Wayne C. Miller, % Minneapolis-Honeywell Regulator Co., 122 N. E. Broadway, Portland, Ore.

READING, PA.—Reading Chapter: December 19—No. 446. Contact O. A. Larson, % Larson Supply Co., 326 Buttonwood St., Reading, Pa.

ROCKFORD, ILL.—Rockford Chapter: December 16—No. 449-450. Contact L. L. Sturch, 1915 Vernon St., Rockford, Ill.

SACRAMENTO, CALIF.—Sacramento Valley Chapter: January 2—No. 446. Contact George M. Bale, % Assoc. Refr. & Equip. Co., 1717 Eye St., Sacramento 14, Calif.

ST. PETERSBURG, FLA.—Sunshine City Chapter: January 7—No. 447. Contact R. B. Schroeder, Florida Power Corp., St. Petersburg 1, Fla.

ST. LOUIS, MO.—St. Louis Chapter: December 17—No. 360. Contact Adolph Braun, 4226 Lafayette, St. Louis, Mo.

SALT LAKE CITY, UTAH—Beehive Chapter: December 19—No. 440-441. Contact W. W. Walker, % G. E. Supply Corp., 310 W. 2nd South St., Salt Lake City, Utah.

SAN DIEGO, CALIF.—San Diego Chapter: December 19—No. 445. January 16—No. 446. Contact C. E. Anderson, 209 West E St., San Diego 1, Calif.

SAN FRANCISCO, CALIF.—Golden Gate Chapter: December 26—No. 444. Contact Ray Winther Co., Attn. George N. Eskra, 1245 Folsom St., San Francisco 3, Calif.

SCRANTON, PA.—Scranton Chapter: January 8—No. 444. Contact W. D. Franklin, 1632 Sanderson Ave., Scranton 9, Pa.

TOLEDO, OHIO—Greater Toledo Chapter: January 8—No. 445. Contact Paul D. Sizer, P. O. Box 69, 1216 Adams St., Toledo, Ohio.

TRENTON, N. J.—Trenton Chapter: December 18—No. 440-441. January 15—No. 442. Contact Harry H. Jaeger, 216 S. Warren St., Trenton, N. J.

WATERBURY, CONN.—Waterbury Chapter: January 8—No. 440-441. Contact A. M. Barbiero, % The Naugatuck Dairy I. C. Co., 34 N. Main St., Naugatuck, Conn.

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3 Exclusive Features

FLAT SEAL FACES

— Uniform — flat — smooth — seal faces.

POSITIVE FLEXIBILITY

A diaphragm acting synthetic rubber ring. No sliding fit between a rubber part and shaft or sleeve.

HIGH GRADE MATERIALS

High grade steel and bronze of known wearing quality are used for the seal faces.

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MODERN DESIGN PRODUCTS CO.

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THERMO-BANK

automatic defrosting

Means:

LOWER TEMPERATURES
HIGHER EFFICIENCY
HIGHER HUMIDITY
ATTENTION-FREE OPERATION

With the Thermobank, temperatures of 32° F. to -40° F. and below can be maintained as easily and with the same freedom from frost as temperatures of 40° F. in a conventional system. Operating with practically frost-free coils, Thermobank maintains the desired low temperatures with higher back pressures, less temperature differential between air and coils; and consequently higher humidity, less drying and more efficient compressor operation.

Essentially, the Thermobank System of Automatic Defrosting consists of a forced convection cooling unit, automatic time controls and a heat reservoir. A portion of the heat extracted during the refrigeration cycle is banked in the reservoir from which it is released to the refrigerant during the defrost cycle.

14

Send for Booklet 16-RS explaining Thermobank System and including useful low temperature information and time-saving rapid selection tables.

"IT'S THE COILS THAT COUNT" specify KRAMER

KRAMER TRENTON CO.

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Seattle, Wash.

W. E. BOOTH
Richmond, Va.

C. S. TUCKER
Birmingham, Ala.

MRS. J. SACKEY
Galesburg, Ill.

The seven men pictured above are newly elected members of the Refrigeration Service Engineers Society International Board of Directors elected at the annual convention held recently in Cleveland. Mrs. John Sackey is the newly elected International Secretary of the Ladies Auxiliary.

R.S.E.S. Chapter Notes

• CENTRAL INDIANA CHAPTER, *Marion, Ind., Oct. 16*—The educational program included the showing of one of the educational films. Twenty-three men were in attendance and a banquet started off the meeting. Despite the elementary nature of the film, it seemed to be enjoyed.

• CHARLESTON CHAPTER, *Charleston, W. Va., Nov. 13*—Short talks were given during the meeting by L. E. Von Woglom and E. A. Montgomery, both of whom reported on their attendance to the National Convention in Cleveland. Mr. Montgomery stated that his attendance at the convention had emphasized in his mind the value of membership in the Society, which at present has a membership of more than 7,200, making it the largest Society of its kind in the industry.

• ELM CITY CHAPTER, *New Haven, Conn., Nov. 3*—Apparently due to the National Convention, which prevented so many of the members from showing up, this meeting was extremely small and very little was accomplished. On November 17th about 45 were in attendance from the chapter at the 2nd annual New England States meeting.

• FAIRFIELD COUNTY CHAPTER, *Fairfield Co., Conn., Oct. 14*—A demonstration of Iceberg freezer lockers by Mr. Davidson was the first item on the program for the evening. Mr. Davidson had to make an early train and the program was arranged to accommodate his schedule. This was followed by a demonstration by the Alco Valve Co., who were represented by A. Ulbert.

At the November 11th meeting, a demonstration of the Thermobank system by Ray Graham of the Graham Refrigeration Products Co. occupied the entire educational program.

• FOX VALLEY CHAPTER, *Fond du Lac, Wis., Oct. 1*—The Detroit Lubricator Co. presented a film for the entertainment of the chapter during its educational program.

On November 6th, a good deal of time was spent in a discussion of the proposed refrigeration code for the State of Wisconsin. The discussion was led by Ernest Miller.

• LONG BEACH CHAPTER, *Long Beach, Cal., Oct. 9*—The meeting was held at the Masonic Temple with an attendance of 51 members and 5 visitors. As usual, the meeting was preceded by a dinner served by Don Thompson and crew. A report of the entertainment committee showed that about 200

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VISOLEAK detects even the smallest leaks before they cause damage to expensive refrigeration systems. Years of use prove it safe, economical, easy to use.

NEW CHARGING SET

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Charging Set—complete with hoses. **$7.50**
Filler only—without hoses..... **6.00**

WHOLESALE PRICES		CASE LOTS
4 ounce bottle.	$ 1.00	48 bottles
8 ounce bottle.	1.75	24 bottles
1 pint bottle...	3.00	24 bottles
1 quart bottle.	5.00	12 bottles
1 gallon can...	16.00	6 cans

SAVE 10% ON CASE LOTS

See your refrigeration supply jobber or write for complete information.

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REPAIRED OR EXCHANGED

We completely disassemble controls, clean, test, check and replace defective or broken parts, and set for proper temperatures.

Domestic Cold Controls (Modern).....	$2.50
Commercial Controls (Pres. or Temp.).....	2.75
Automatic Expansion Valves.....	1.75
Thermostatic Expansion Valves.....	3.00
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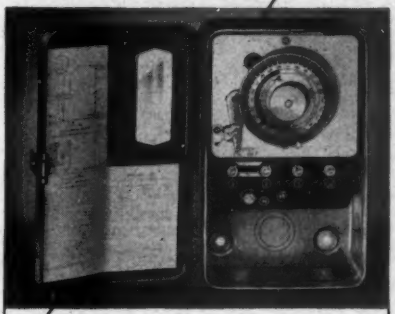
Defrosting AUTOMATICALLY CONTROLLED



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Why worry about defrosting? Here's a Switch that provides dependable time control for SHARP FREEZERS in all types of automatic defrosting . . . in locker plants, dairies, breweries, packing houses and commercial refrigeration. Regular defrosting increases efficiency and reduces operating costs.

The PARAGON LINE offers service proved . . . precision . . . quality Time Switches and Timers . . . rugged and durable . . . with a great performance record.

Paragon can produce Time Controls for any system such as Freon, brine, ammonia, etc., regardless of temperature and whether defrosting is done by hot vapor, electric heat or water spray. Put your defrosting problems up to Paragon engineers.

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Paragon *Two Rivers* WISCONSIN
BUILDERS OF ELECTRICAL EQUIPMENT SINCE 1906

members attended the Orange County picnic from the chapter. Contributions from the members helped to allay the expenses of the picnic. Les Gould was approved as a member of the Exclusive Five Club. He was also warned that if he did not bring one of his partners to the next meeting he would have to donate another $5.00 for membership fees. Mr. Phillips gave a short talk on a trip to the Drayer-Hanson plant in Los Angeles, and extended an invitation given through him by the Drayer-Hanson Co., to all chapter members to make the same trip.

• METROPOLITAN NEW YORK CHAPTER, *New York, N. Y., Nov. 8*—Mr. Thompson of the Davison Chemical Corp. offered his regrets that the equipment for the educational part of the program had not arrived due to the trucking company strike. In place of the scheduled program, however, he gave an interesting talk on effects of moisture in various types of systems. He answered many questions on the use of Silica Gel, and explained its proper application. Fred Asselmeyer, President of the chapter, gave a complete report on the proceedings of the National Convention.

• NEW BRUNSWICK CHAPTER, *St. John, N. B., Oct. 11*—This was a joint meeting of the Nova Scotia and New Brunswick Chapters, with the Nova Scotia Chapter acting as host. Len Foster, President of the Nova Scotia Chapter, welcomed the visiting members to the first joint meeting. It was the consensus of opinion at the meeting that a semi-annual meeting of this type should be held each year, and that the next one should be held in New Brunswick.

As a part of the educational program, the meeting was adjourned and members were taken to a new apple packing and storage plant outside of Kentville. It was a very interesting and educational trip. After dinner several films were shown, among them "Principles of Refrigeration," "Adjusting and Checking the Expansion Valve," "Ready Made Magic" and "Adjusting and Repairing the Thermostatic Expansion Valve."

• OIL CAPITOL CHAPTER, *Tulsa, Okla., Oct. 16*—The meeting was devoted entirely to business, during which the final reports of outgoing officers, such as Secretary and Treasurer, were read and accepted. A nominating committee, consisting of Floyd Benigar, John Egger and Gordon Miller, was appointed. They are to report at the next meeting.

• ONTARIO MAPLE LEAF CHAPTER, *Toronto, Ont., Oct. 18*—F. Y. Carter, Detroit Lubricator Co., Detroit, Mich., gave an interesting talk on expansion valves, illustrated with slides. Entertainment Committee Chairman C. R. Davis reported on the recent stag party held at the Almonte Hotel on October 4th. This party proved to be a huge success, with 105 in attendance.

On November 6th the entire meeting was devoted to a very lively business session, during which five new applications for membership were received and given consideration.

• ST. LOUIS CHAPTER, *St. Louis, Mo., Sept. 17*—The program for the evening was furnished by Earl Jennings, representing the Temprite Products Corp., who gave a very thorough and educational talk on the Temprite coolers and their service problems. His equipment included several cutaway models of coils showing construction details and servicing facilities. He went into a complete installation setup on Temprite, explaining the reason for oil traps and surge tanks in the system.

• SAN DIEGO CHAPTER, *San Diego, Cal., Oct. 22*—About 40 members were in attendance at this meeting. The evening was taken up with a full program of local business and the only educational feature was the showing of one of the series of films.

The big event of the month was the resumption of the annual dinner-dance which had been postponed during the war years. An overflow crowd of 200 members and guests was present at the La Mesa Inn which had been taken over for the evening. Following a delicious fried chicken dinner, dozens of door prizes were given away. Among the prizes were electrical appliances, tools, champagne and the grand prize of a combination radio-phonograph. Among those present were members of the Orange County and Los Angeles Chapters. Dancing and entertainment followed the dinner and drawing, and continued until the wee hours. Tom Connors, Chairman of the event, deserves a vote of thanks for his efforts and plans, which came off without a hitch.

• TWIN CITIES CHAPTER, *Minneapolis, Minn., Oct. 1*—A Nominating Committee, consisting of Glen Swarting, Bill Mahnke, Lester Ost and Miles Chadwick, was appointed during the business session of the meeting. On the educational program, Mr. Dunlap of Ranco, Inc., gave an interesting talk on Ranco controls.

• WESTERN MASSACHUSETTS CHAPTER, *Springfield, Mass., Oct. 8*—Mr. Nickols, representing Ideal Industries, Inc., demonstrated the use of Thermo Grip electric soldering tools, using two different sizes of these tools to soft solder and silver solder various sizes of tubing. The demonstration was a most interesting one, with the members of the audience thinking up the hardest possible tricks for the demonstrator to do.

On October 22nd, Ray Graham gave a talk on Thermobank units, illustrated by slides. He had for demonstration purposes, also, a ¼ hp. packaged Thermobank unit, which proved most interesting. He followed his talk with a sound film on servicing and adjusting expansion valves. A buffet supper wound up the evening.

S S S

BACK ISSUES WANTED

COPIES of certain back issues of THE REFRIGERATION SERVICE ENGINEER are needed by subscribers to complete files. Urgently needed now are copies of January 1934, November 1935 and April 1936. Fifty cents per issue will be paid for these issues. Mail to Nickerson & Collins Co., 433 N. Waller Avenue, Chicago 44, Ill.

● Here's a general-utility housing for those motor-starting capacitors. Accommodates standard 1⅜ x 3¼" unit. Heavy-gauge metal. Completely covers and protects capacitor and terminals. Fits motor-frame contour. Provides strong, rugged, shock-proof installation. No auxiliary caps or brackets required. It's another excellent reason for standardizing on Aerovox for your motor-capacitor replacements.

• Ask Your Jobber...

Ask for this handy, inexpensive, first-class-job housing. Ask for those exact-duplicate or universal types you need as listed in the latest Aerovox catalog. Or write us.

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FOR RADIO-ELECTRONIC-ONIC INDUSTRIAL APPLICATIONS

AEROVOX CORP., NEW BEDFORD, MASS., U. S. A.
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Too bad you aren't an ostrich—particularly when a tough, puzzling service problem comes up. But you can't duck it the way the ostrich tries to and expect to stay in business long!

Newcomers, yes, and old-timers, too: you never know when a puzzling service job will face you. Then's the time when you'll wish you had the sound knowledge which comes with proper training to back you up.

TAKE U.E.I. TRAINING

Successfully training men in refrigeration since 1927, Utilities Engineering Institute gives you the kind of training you can use as a sound basis on which to build up or as a brush-up on facts you may have forgotten—training proved by the many U.E.I. men who are in the service business today!

Write today for FREE facts about U.E.I. Balanced Training — technical home-study combined with shop practice.

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VETERANS: TRAIN WITH U.E.I. UNDER THE G.I. BILL

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Dept. 45, 1314 W. Belden Ave., Chicago 14, Ill.

Please give me more information about Refrigeration and Air Conditioning Training, as promised in your Refrigeration Service Engineer December, 1946 ad.

Name .....

Address .....

City..... Zone..... State.....

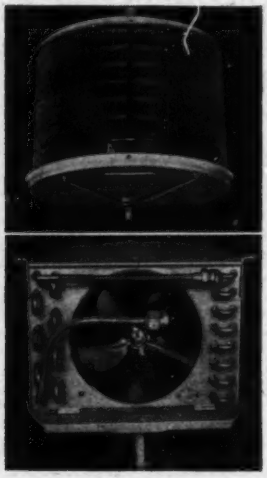
New and Improved Appliances

Information contained in this department is furnished by the manufacturer of the article described and is not to be construed as the opinion of the Editor.

"Curvette"

A NEW unit cooler of distinctive and attractive design has been developed by the Kramer Trenton Co. for cooling beverage counters, food chests, reach-in refrigerators and other fixtures.

As can be seen from the front and rear view illustrations, this cooler consists of a bank of finned coils, neatly curved in a semi-circle with the fan and motor placed out



of the way and out of sight inside of the curve of the coils, where moisture can not drip upon them. The motor is permanently lubricated, requiring no attention whatever. Tubing, mounting and drain connections are all easily reached.

Construction is durable and corrosion-free, the complete unit is made of copper or aluminum. There are no steel parts.

This distinctive new unit is not only attractive in appearance but efficient in operation due to the fact that the radial air flow assures uniform refrigerator temperature and a high rate of heat transfer.

Measuring only 13" wide x 10¼" deep x 11" high, the unit has a capacity of 1500 Btu. per hour at 10° temperature differential and a capacity of 2250 Btu. per hour at 15° temperature differential.

Freezer-Icemaker

A NEW line of 38 cubic foot freezers, combination freezer-refrigerators, and combination freezer-icemakers was presented recently by the Bryant Corporation. The units are of the upright, reach-in type, and feature all-aluminum, sectional construction. This latter feature allows installation of the freezers in basements and locations which would not ordinarily accommodate a box of this size.

The design of the cabinet is based on a portable, air-borne refrigerator built for the armed forces, and many of its construction features have been retained. In the full freezer model, the Regent, three of the four cold plates are used as shelves. Fast freezing is accomplished by placing the packaged food in direct contact with the plate surface. Illustrated, is the Kenwood, combination freezer-refrigerator. The Kenwood is divided into two sections with the 45-degree refrigerator in the upper half and the fast freezer in the lower section. Separate thermostatic controls are provided for each compartment. The combination freezer-icemaker model, the Windsor, has been arranged so that all four cold plates are usable as shelves for direct-contact fast freezing of ice cubes.

G.E. Alarm

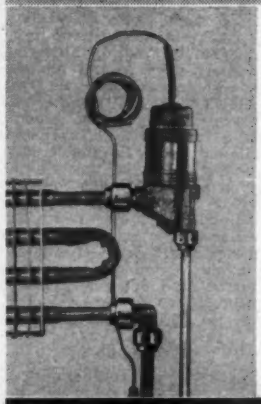
A NEW alarm thermostat designed for use in a circuit which will give a warning of any failure in a frozen-food cabinet has been introduced by the Control Division of the General Electric Company. Compact and easy to install, the new thermostat

initiates an alarm in adequate time to permit correction of trouble before the contents of the box are spoiled.

Contacts of the thermostat should be wired in series with an indicating light, electric clock, or other device to which the user ordinarily gives frequent attention. As long as the temperature is safely below the level at which the thermostat is set, the lamp glows or the clock runs. If the temperature rises to approach a dangerous level, however, the thermostat opens and the power to the light or clock is cut off.

If the power supply to the

STA-TITE THE REFRIGERATION FLARE NUT *which cannot Creep or Work loose*



Moisture will work its way along the threads, to fill the space between the fitting and the inside of the flare nut. Confined in this space, the water, in its attempt to freeze during the operating cycle, develops a tremendous pressure — 16,400 p.s.i. at 20° F. Something has to give at such high pressures (1) the nut may stretch, (2) the male fitting may collapse, (3) the copper tube flare may extrude — any one of which will allow the flare nut to loosen. You know the rest—moisture in the system and/or loss of refrigerant. A condition which has long baffled the refrigeration industry

NOW—Superior engineers have found a positive cure—the new "STA-TITE" Flare Nut. By simply providing relief openings in **otherwise standard flare nuts**, the possibility of pressure being created is entirely eliminated — **the flare nut stays tight!**

Thousands of "STA-TITE" Flare Nuts already in service have yet to show a single failure Moisture trouble, costly and annoying leaks, because of so-called "creeping" flare nuts, have been eliminated completely

Get "STA-TITE" Flare Nuts from your jobber Use them on **all** connections which are subject to frequent or occasional frosting and defrosting Banish "creeping" and leaks forever!

"STA-TITE" is another Superior contribution to better refrigeration!

*U.S. Patent 2,323,089

NO.134 A

SUPERIOR VALVE & FITTINGS COMPANY

PITTSBURGH – 26 – PENNSYLVANIA

OFFICES IN PRINCIPAL CITIES • STOCKS: CHICAGO 16 • LOS ANGELES 21 • JOBBERS EVERYWHERE

HERVEEN the Replacement Refrigerant

Servicemen—Herveen is the IDEAL REPLACEMENT GAS for Meter-Misers. When your Frigidaire Meter-Miser customers need service on their unit, don't turn them down with the statement "the refrigerant is not available." We can deliver

HERVEEN the IDEAL

REPLACEMENT REFRIGERANT

Many service companies are using this refrigerant for charging Meter-Misers in their localities.

★ Meter-Miser calls become routine if you have a supply of HERVEEN.

★ Installing HERVEEN does not involve more than average care.

MODERN GAS CO., Inc. Manufacturers & Refiners
1084 Bedford Ave., BROOKLYN 5, NEW YORK

compressor is cut off the light goes out immediately, warning of trouble even before the temperature begins to rise. A warning is given immediately if an alarm wire breaks or the light bulb burns out. Thus the circuit gives a positive indication that everything, including the alarm itself, is operating satisfactorily.

The thermostat uses 110-volt alternating current, and is sealed to prevent the entrance of moisture or dust. Calibration is guaranteed within plus or minus 3° F. Leads can be furnished in any desired length.

Plastic Hammers

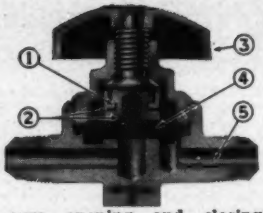
NUPLA plastic hammers, made by the New Plastic Corporation, are hard hitting "softies." They use a new semi-soft, flexile plastic that heals itself when dented or deformed. They hit hard blows without damage to

delicate parts or finishes. Non-inflammable. Not affected by oil or gasoline. They are more durable than rawhide because they do not curl or permanently deform. They do not rebound like rubber; they will not support combustion or explode. Will not chip or crack.

Diaseal Valves

THE Imperial DiaSeal Valve, an entirely new type of refrigeration diaphragm valve featuring "either-way" flow, no spring, only two moving parts, easy finger-tip action and a new kind of diaphragm, was introduced by The Imperial Brass Mfg. Co., Chicago, at the recent All Industry Refrigeration and Air Conditioning Exposition.

Advantages listed for this valve are: (1) direct lift, without springs, providing positive control with flow in either directions; (2) simple construction, with only two moving parts, assuring greater dependability; (3) quick,



sure opening and closing with less than two turns of handle; (4) long life diaphragm which is impervious to all common refrigerants and has withstood over 1,000,000 openings and closing in tests under refrigerant pressure; (5) inlet and outlet ports in line.

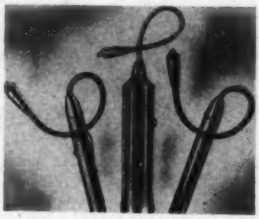
Both internal parts of the DiaSeal Valve lift out with the bonnet and simplify soldering valve in the line. It is pointed out that extremely low height cuts installation space requirements to a minimum. Valve bodies are made from brass forgings.

Valves are available in two-way and angle types with either flare or solder connections.

Flex-Lites

UNIQUE in the field of flashlight equipment is the announcement of a new series of "Flex-Lites," manufactured by the Aero-Motive Manufacturing Company, Kalamazoo, Michigan.

In the three new models, it is reported—the Junior, Junior Deluxe, and Master Flex-Lites—each have a long flexible extension bulb-retainer which

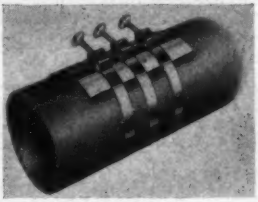


replaces the conventional bulb assembly. With this unique, new construction feature, a powerful, searching beam of shadowless light can be introduced into heretofore inaccessible areas, it is claimed.

Made of polished aluminum, they are lightweight and sturdy. The Flex-Lites are waterproofed, it is stated, and can be immersed in water without shorting. The Junior model with screw type switch in base and Junior Deluxe model with convenient pocket clip and thumb type sliding switch for positive contact have overall lengths of 15 inches and use two standard size AA Penlite batteries. The Master model, 16½ inches overall, uses two regular size flashlight batteries, and also has thumb type switch. Handy for carrying in tool boxes, automobile glove compartments, or other kits, it is said this new series has a wide use in industrial plants, garages, homes and for many other general utility purposes.

Pipe Clamp

A NEW all stainless steel pipe-leak clamp is announced by Marman Products Co., Inc., Inglewood, California. This clamp has been tested without leaking at pressures exceeding 240 PSI.



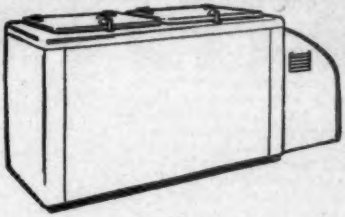
The clamp consists of a Hycar pad which is resistant to deterioration by water, gas, oil, gasoline, etc. An annealed backing plate covers the pad and can be handformed to the desired pipe contour. Pad and patch plate are secured over lead with Marman Universal Stainless Steel clamps of the continuous band type which have a size range from 9/16″ up to the maximum diameter for clamp. High strength and corrosion resistance are assured with this combination. The ability to use one pipe-leak clamp for numerous pipe diameters reduces stock and eliminates the necessity and expense of "fitted" clamps.

Six sizes of Marman pipe-leak clamps fit all pipe diameters from ½″ to 12″. Sizes over 12″ are available upon request.

Write today for the Marman folder illustrating these and other Marman clamps.

FREEZER CABINETS

Worthy of YOUR Best Equipment . . . .



SANITARY 12.5 Cubic Foot Models
Available Complete, less Condensing Unit

Heavily built with steel welded frame, SANITARY Freezer Cabinets are now in limited production for **shipment** on a 30 to 60 day basis. Each cabinet is complete with freezer plates, cold control and Freon 12 expansion valve requiring merely installation of your own condensing unit. Every detail in these Freezer Cabinets is aimed at high efficiency at lowest operating costs.

PLACE YOUR ORDER
for these "top quality" SANITARY Freezer Cabinets TODAY.

SANITARY REFRIGERATOR CO.
Manufacturer
Fond du Lac, Wisconsin

Ice Refrigerators For More Than 40 Years
Quicfrez Farm Locker Plants Since 1939

REPAIR AND SERVICE REFRIGERATORS
WIRING, COPPER TUBING, ELECTRODES, ETC.

with

IDEAL "THERMO GRIP"
Electric
SOLDERING TOOLS

More and more refrigerator service men are turning to "Thermo-Grips" for all of their soldering work, because "Thermo-Grips" are so easy to use and do a better job—faster!

"Thermo-Grips" are more than just ordinary soldering irons—they are handy electrical soldering tools designed to handle hard and soft soldering—sweating and unsweating threadless copper pipe and fittings, soldering terminals, lugs, etc.

Safe—no pre-heating or open flame hazard. The part touched heats almost instantly. Heat

is concentrated on the spot to be soldered—no danger to nearby parts, walls or partitions.

Ask your Jobber about a demonstration—today!

Distributed Through
AMERICA'S LEADING WHOLESALERS

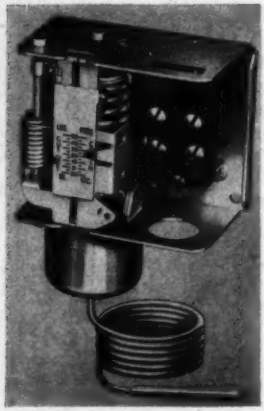
PROMPT DELIVERY

1939

IDEAL INDUSTRIES, Inc. (Successor to Ideal Commutator Dresser Co.)
1092 PARK AVENUE SYCAMORE, ILLINOIS

Penn Control

AN entirely new line of refrigeration pressure and temperature controls featuring 2-pole construction was recently announced by Penn Electric Switch Co. of Goshen, Indiana. This line designated as the 270 Series includes "single" temperature, low side pressure, and "dual" controls. The dual controls combine in one unit the temperature or low side pressure mechanism with a built-in high pressure safety cut-out.



According to the manufacturer this new line is the first and only one in the refrigeration field that incorporates a load-carrying, 2-pole construction. This feature, states the manufacturer, provides the following application advantages:

(1) Controls polyphase motors (where protection against single phasing is provided) without the use of line starters.

(2) Incorporates two separate circuits necessary for the control of single phase multiple systems or polyphase systems when one pole is used as a pilot control. This one control can start simultaneously the condensing unit and open the magnetic valve.

(3) When wired as a 2-pole switch in single phase circuits, it always breaks the "hot" line. Thus, equipment is protected against some of the hazards of motor insulation breakdown.

(4) Controls two separate load circuits such as two single phase motors . . . controls "high-low" speed circulating fans in walk-in coolers, display cases, etc. . . . controls any other combination within electrical specifications.

In addition the 270 Series incorporates a novel and simple "sight-set" calibrated scale which shows directly both cut-in and cut-out points. This direct-reading visible scale makes it possible to set the cut-in and cut-out points directly without bothersome subtraction or addition, according to the manufacturer.

Details of construction and specifications are given in a broadside, Form 2601. Free copies of this piece are available by writing to Penn Electric Switch Co., Goshen, Indiana.

Freeze Warden

THE Crescent Laboratories, Montclair, New Jersey, announces their first post-war product, the "Freeze Warden." This independent unit is designed to protect the frozen foods in deep freeze lockers in the event of power or refrigeration failure. The "Freeze Warden" has its own source of power and does not depend upon house current.

A smartly designed plastic case houses this warning system which may be placed anywhere in the home or place of business, although the actual refrigeration unit may be a hundred feet away. In the event of a power or refrigeration failure, the circuit is automatically closed and the alarm sounds when the temperature rises to a pre-set temperature of 20-25°F, thus warning that something is wrong with the refrigerator system and saving the contents from spoiling.

C-Leak

C-LEAK according to its manufacturers, is a light blue liquid specially developed for the purpose of detecting leaks in any system under pressure. It is used to locate pressure leaks in valves, gauges, boilers, refrigeration equipment, and to test welds. It is complete in itself and requires no additional equipment in its use.

Chemically, C-Leak is an extremely inert substance. It will not react with oxygen, hydrogen, acetylene, Freon or any other gas used in refrigeration systems, or any combination of these gases. It will not affect iron, steel, brass, copper, lead, or any other metals. It is non-toxic and non-irritating to the skin. This product shows a high degree of stability. It will not decompose during prolonged exposure to temperature as high as 250°F, however C-Leak should not be allowed to stand at freezing temperature for long periods of time.

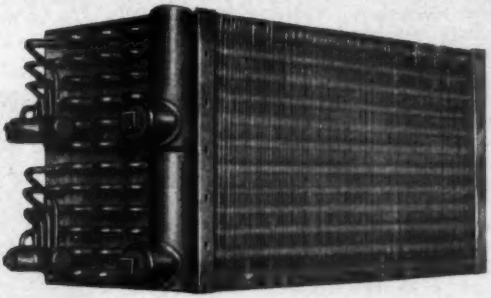
C-Leak is very simple to use. Merely paint the liquid with a brush or cloth on the area to be tested while the system is under pressure. A bubble will form immediately over the leak. With extremely slow leaks, such as are encountered with Freon gas in refrigeration systems, a white spot will develop caused by an accumulation of very small bubbles. Freon leaks which require 48-72 hours to be detected by other methods have been located in less than one minute. After using, it may be removed with a damp cloth or allowed to dry and then brushed off. When dry it leaves only a faint, almost invisible film.

The physical properties of C-Leak are such that it will adhere to any surface regardless of its nature. It is sufficiently viscous so that it will not run off vertical surfaces. It will cling to glass or metal even if greasy or oily. It can be applied over an oily surface without removing the oil since it has a quick-action oil dissolving agent incorporated in it.

C-Leak is positive, fast and economical. It provides a solution to one of the most common problems encountered by manufacturers and servicers of pressure equipment.

FIN COILS

Rempe



Coil shown: Integral liquid header. Finger feeds to circuits. Common suction header for return of refrigerant gas.

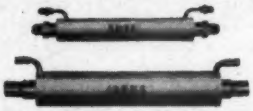
For all types of commercial or industrial low temperature installations. To your specifications. Sizes to 16 ft. lengths.

Copper tube with aluminum fins, or all steel, hot galvanized. Use with any refrigerant, or liquid cooling medium.
All coils tested to 400 lbs., and dehydrated before shipment.

Send B/P or details for prompt quotation. Ask for new Rempe Catalog.

REMPE COMPANY
358 No. Sacramento Blvd., Chicago 12, Ill.

MINIMUM **PRESSURE DROP** *with*
HEAT-X CAST ALUMINUM
HEAT EXCHANGERS



Shown are two models of Heat Exchangers —various sizes available. Both liquid and suction are copper tube. Ideal for use as water cooled capacity boosters on air cooled units. No internal joints—no by-pass.

MORE **BTU's PER WATT** *with*
HEAT-X CAST ALUMINUM
LIQUID COOLERS

Here is one of Heat-X Coolers you can select from a range of sizes.

No freeze-up damage and no short cycling are two outstanding features. These Coolers combine top performance and low cost.

WRITE AT ONCE FOR HEAT-X ENGINEERING SPECIFICATIONS AND CAPACITY TABLES

Orders Promptly Shipped

THE HEAT-X-CHANGER CO., INC.

MIDWEST REWA MEETING

A MEETING of the Midwest Refrigeration Equipment Wholesalers Association will be held at the Hotel Phillips and Hotel Muehlebach, Kansas City, Missouri, January 10th and 11th.

Election of officers for the year 1947 will be held with a closed meeting for the Midwest Jobbers on the morning of January 10th at the Phillips Hotel and an open meeting with the manufacturers at the Phillips Hotel in the afternoon.

A cocktail hour and banquet will be held Friday evening at the Muehlebach Hotel and on Saturday, January 11th, there will be special committee meetings.

Manufacturer's representatives are invited to attend. Hotel reservations should be sent to E. L. Tramposh, Refrigeration Equipment Company, 2400 Grand Avenue, Kansas City 8, Missouri.

S S S

KEEP PRICES DOWN ADVISES ACRM

EVERY effort to prevent price rises following the lifting of controls, and to effect all possible production economies and efficiencies in order to achieve that end, was urged as individual company policy throughout the industry, in an announcement made today on behalf of the Executive Committee of the Air Conditioning and Refrigerating Machinery Association.

The statement for the Executive Committee, given out by William B. Henderson, Executive Vice President of the Association, said:

"It was the consensus of the members of the Executive Committee, who represent many of the larger manufacturers of air conditioning and refrigerating machinery, that the companies of this industry, and, in fact, that industry as a whole, should endeavor in every possible manner to prevent price increases under the free economy resulting from the lifting of price controls.

"While the problem of this and other industries is to get production up and keep prices down, the committee could adopt no procedure either for the industry or for member companies of this Association. But it did suggest that each company make a careful check of the means by which production savings might be effected. All possible production and administrative economies and efficiencies should be employed in an effort to counterbalance insofar as possible any higher costs of essential materials and components, such as steel, copper, zinc, electric motors, etc. It was felt that if increases in price do become necessary, they should result from increased costs which the manufacturing company is unable to prevent, or unable to compensate for by lowering present operating costs."

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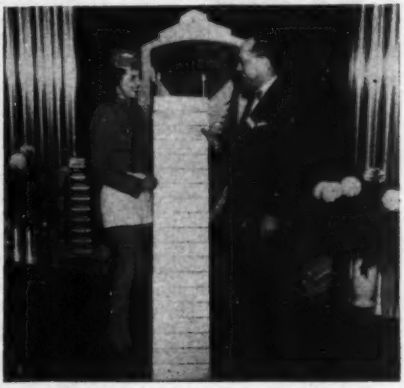


Miss Peerless and M. W. Knight, General Sales Manager of Peerless of America, Inc., are shown above holding the new Peerless flash plate, exhibited for the first time at the Cleveland exhibition.

NEW PRODUCTS AT THE ALL-INDUSTRY SHOW

A NUMBER of the new products displayed for the first time at the All-Industry Refrigeration and Air Conditioning show, held recently in Cleveland, O., are described in the New and Improved Appliances section and in other pages of this issue. Following is a brief description of other new products displayed:

BONNEY FORGE AND TOOL WORKS, Allentown, Pa., had on exhibit its regular line of mechanics hand tools for refrigeration service. In attendance at the booth were F. S. Durham, Jr., assistant to the president, and C. D. Otterson, sales manager. On alternate days, the sales representatives from various parts of the country were in attendance to meet the many visitors from their sections. They included O. W. Cadle from Pennsylvania, Southern New Jersey and Maryland; H. D. Wixson from Michigan; C. A. Macan from New York State; and H. D. Wixson, Jr., from Ohio and West Virginia.

MARLO COIL CO., St. Louis, Mo., exhibited for the first time a new tower unit, together

Season's Greetings

We are grateful to all you swell customers for the wonderful support given us throughout the year.

Such loyal support merits the finest service it is humanly possible to give and we shall continue in our efforts to make Chase Refrigeration Supply Co. worthy of your patronage.

So, with much pleasure, we offer sincere good wishes for your happiness at Christmas time and hope the New Year brings you all the good things in life.

CHASE refrigeration supply co. NOT INC.

546 WEST 119TH ST., CHICAGO 28, ILL. - Phone PULlman 5125

STOP

TERMINAL LEAKS COMPLETE KIT

(3 Terminals)

$5.50

PAT. PENDING

Lower Prices in Quantity

Please Mention Jobber's Name

Coldspot Couplings and Dome Gaskets. Immediate Delivery. 25 cents each in lots of 10

WAGNER REPLACEMENT TERMINALS

A research development designed to repair terminal leaks on sealed units, instantly and permanently on the job—

IN 5 MINUTES

No special tools or equipment required. Now available for Crosley F 12. Soon available for Frigidaire, Westinghouse, Norge, Kelvinator, and TECUMSEH (Chieftain) UNITS.

Territories Open to Manufacturers Representatives

WAGNER PRODUCTS CO.
2127 East 35th St., Brooklyn 10, N. Y.

Firm .....

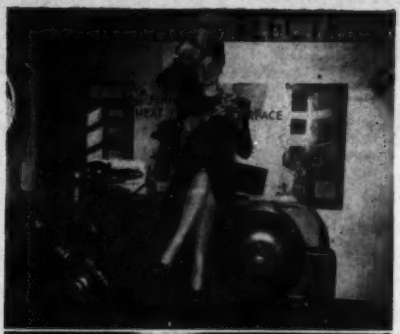
Address .....

Jobber .....

Send Check or Money Order
We Will Ship Prepaid

No. of Complete Kits..... No. of Couplings.....

No. of Dome Gaskets..... ☐ C.O.D. ☐ Pre-Paid



with a modern streamlined "Turbo-Flo" wall type panel cooler and a new type ceiling unit cooler equipped with venturi fan rings, integral heat exchangers and thermal valves. Also on display was a cutaway sectional evaporative condenser and floor type industrial cooler unit.

Airtemp Div., Chrysler Corp., Dayton, O., displayed a newly designed balanced line of sealed, radial compressors in the smaller commercial class. This brings the radial type compressor, an exclusive development of Chrysler Corp., into the 1/6 to 2 horsepower class. They were formerly limited to models ranging upwards from 3 horsepower. The new line will be produced in 2, 4 and 6 cylinder models, operating at 1750 and 3450 rpm.

General Electric Co., Schenectady, N. Y., exhibited a new quiet magnetic starter, designed for use wherever a quiet motor control for air conditioning and refrigeration equipment is essential, such as in homes, offices, stores, hospitals and public buildings; a new alarm thermostat designed to give a warning of any failure in a frozen food cabinet in adequate time to permit correction be-

---

In the four pictures in the left hand column are shown, top—a picture of the General Electric booth at the All-Industry Refrigeration and Air Conditioning Exhibition in Cleveland. In it Miss Harriet M. Werle, of Pittsburgh, Pa., is shown holding the world's tiniest refrigerator, while seated atop a mammoth General Electric unit. The Airserco miniature refrigerator is manufactured in Pittsburgh, Pa., by the Aircraft Service Co. This scientific instrument is used to test the operation of thermostatic controls as used in the refrigeration and air-conditioning industry. Airserco's miniature refrigerator is capable of temperatures of 22 degrees below zero.

Second from top is the Alco Valve Co. booth at the show. New Alco Products on exhibit for the first time were: A temperature override attachment for use with standard Alco thermo valves in air conditioning installations to maintain constant temperature control; a snap-action, temperature responsive suction valve to regulate flow in multiple evaporator systems; an electronic liquid level controller; and the Thermo-Limit valve with pressure limiting feature, introduced to the industry several months ago.

Third from the top is Peerless of America, Inc., booth. Peerless introduced a new flash plate for the first time at the show. Bottom is a picture of the Monsanto Chemical Co. booth. Shown left to right, is F. Faxon Ogden and Howard S. Heffernan, both of the company's sales department.

SEALED UNIT PARTS COMPANY

• TIME and LABOR SAVING PARTS for REFRIGERATION MECHANICS •

CROSLEY

SEALED TERMINALS

Outside Installation
Part No. 1020
(For F-12 Models)

Repair leaky terminals on all sealed Crosley F-12 compressors

Installed from the outside with our simple installation tool (Part No. 23051) in a few minutes.

Inside Installation
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Part No. 1080-F-12 Models
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Inside replacement for leaking or shorted terminals.

NORGE

CHECK VALVES
Part No. 1040

For the popular belt driven Norge small compressors.

SEALED TERMINAL PACKING WASHERS
Part No. 1050

Repairs leaky terminals on sealed SO_2 units. Installed from the outside in a few minutes without opening the compressor.

SEALED TERMINALS
Part No. 1100

Complete assembly. Installed from inside.

FRIGIDAIRE

METER-MISER TERMINALS

Part No. 1060

Replaces leaking terminals on Meter-Miser compressors.

Installed from the inside.

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SEALED TERMINALS

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Replaces leaking, shorted or grounded terminals on Westinghouse Compressors.

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IMMEDIATE DELIVERY—MONEY BACK GUARANTEE

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LOOK IN THE NEXT MONTH'S ISSUE FOR OTHER SEALED UNIT PARTS

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B. S. & B. MIDGET SAFETY HEAD

A "throw-away" pressure relief device for small air conditioning and refrigeration units. Price is so low that when over-pressure breaks the rupture disc you will generally find it cheaper to throw away the complete "Midget" and install a new one than to renew the rupture disc in a conventional type *Safety Head*. Rupture Disc installed, pressure tested and sealed at the factory.

No gas leakage. No possibility of a service man putting in a rupture disc of wrong material or bursting pressure.

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¼", ⅜", and ½" connections. Rupture Disc of silver or coated aluminum . . . bursting pressures from 150 to 500 lbs.

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SALES OFFICES: 24th Floor, Power & Light Bldg., Kansas City 6, Mo.
PLANT: 7500 East 12th Street, Kansas City 3, Mo.

fore the contents of the box are spoiled; a selector control, which when used with a three wire floating type of thermostat, checks the position of the instrument every 60 seconds. It permits close control of temperature or humidity under widely varying conditions, and is well suited for general air conditioning applications and process air conditioning.

BLACK, SIVALLS AND BRYSON, INC., Kansas City, Mo., exhibited their B. S. and B. "Atom", which is a small rupture disc pressure relief device, designed for factional horsepower condensing units.

MILLS INDUSTRIES, INC., Chicago, Ill., exhibited for the first time a new direct drive condensing unit; a new bottle vendor for Coca Cola with change making feature; and a counter ice cream freezer with fast hardening attachment. The condensing unit on display was in operation with internal lights and a window peep.

SPORLAN VALVE CO., St. Louis, Mo., displayed the new Sporlan "Catch-All" with combination filter and dehydrator. The drying and filtering element consists of a molded block which is insoluble in moisture, refrigerants or oil, and will not powder or pack.

Pictured are two condenser units recently completed to provide an accurate comparison of the costs, construction, application and efficiency of plain copper tube as against integral finned copper tube in refrigeration condenser work. Both units are based on three-ton capacity and were built by Acme Industries, Jackson, Michigan. The tubes were furnished by Wolverine Tube Division, Detroit.

The larger unit, on the left, was constructed using Wolverine Plain Copper Tube. The smaller unit, on the right, was tubed with Wolverine Trufin, integral finned tubes.

The resulting comparison charts and the actual units were exhibited in the Wolverine Booth No. 313 at the All-Industry Exposition in Cleveland.

STURTEVANT OFFICE MOVES

MIDDLE Atlantic District sales headquarters of the B. F. Sturtevant Company Division of Westinghouse Electric have been moved from Camden to new offices in the Westinghouse Building, 8001 Walnut Street, Philadelphia, it has been announced by A. G. Mutimer, district manager. The offices were formerly located at the Company's plant at Cressmont and Haddon Avenues, Camden.

W. E. ANGLIN JOINS DR. PEPPER

EFFECTIVE December 1, William E. Anglin will join the Dr. Pepper Company national headquarters staff at Dallas as research engineer in the Dr. Pepper cooler and vendor department.

W. E. ANGLIN

Mr. Anglin will be engaged in the research and further development of a complete line of refrigeration equipment for the Dr. Pepper Company and Dr. Pepper bottlers.

A graduate refrigeration technician, Mr. Anglin has been associated with Servel, Inc. at Evansville, Indiana, for the past four years. He held the post of Factory Service Supervisor for Servel's electrical commercial department.

During the war, Mr. Anglin was assigned to a number of special refrigeration projects, including blood plasma and penicillin cabinets, sub-stratosphere chambers and motor transit refrigeration.

While at Servel, in addition to his regular duties, Mr. Anglin taught refrigeration training courses at the Evansville Evening College of Vocational Training. He was also active in the Refrigeration Service Engineer's Society, serving twice as president of the Evansville, Ind., chapter during 1944 and 1945, and as treasurer of the Wolverine chapter in 1939.

Mr. Anglin has more than eleven years experience in service and application engineering, both in commercial and household refrigeration. At one time he operated his own sales and service concern in Lansing, Michigan, where he specialized in the rebuilding of hermetically-sealed units on a national scale.

CABINET DRINKING WATER COOLERS

Glass filler or bubbler coolers are available with capacities up to 25 gallons per hour. Cabinet of heavy steel welded construction with white baked enamel surface. Also available now — normal and high suction pressure water coolers for commercial use.

Write for latest data.

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REFRIGERATION DIVISION

DAY & NIGHT MFG. CO.

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MONROVIA, CALIFORNIA

SOLD THROUGH REFRIGERATION WHOLESALERS AND DEALERS

HAVE YOU THESE BOOKS?

Refrigeration men at the All-Industry Exposition were keenly interested in the display of technical books offered by us.

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"DID I LOOK AT THAT DOOR GASKET?"
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MARSH TO BUILD NEW QUARTERS

AN ANNOUNCEMENT to the effect that C.P.A. approval has been given to the Jas. P. Marsh Corporation, well known manufacturer of industrial instruments and heating specialties, to start immediate construction of a new factory and office building comes from Mr. Barrett Scudder, President of the company. He states that the new building will be erected on a five-acre tract of land located at Howard Street and St. Louis Avenue in Skokie, Illinois (Chicago Suburb).

Architects drawing of new marsh plant

According to Mr. Scudder, the building will incorporate the latest in industrial building design and construction throughout. It will cover an area of approximately 100,000 square feet and will be a one-story unit providing ample working facilities and the advantages of having the factory on one level. The building is to be constructed of concrete and steel with cut stone facings, with a monitor type roof over the factory.

The general offices will be of modern design, according to company officials. Among other features, it will be air-conditioned throughout and the latest method of soundproofing and lighting will be employed.

One of the interesting features of the building will be the heating system. As manufacturers of heating equipment, Marsh Corporation is vitally interested in the research and compilation of definite facts on heat control. Therefore, the new building is to be used as the "guinea pig" for extensive research on heating methods.

"Many months have been devoted to the investigation of available industrial building sites in and around Chicago, the choice hinging on several factors: first, adequate property to allow for additional expansion; second, location in a place that would be free of industrial smoke and grime to insure healthful working conditions; third, adequate transportation facilities; fourth, close enough to Chicago's market facilities to insure adequate material supply; and fifth, central location in an area that would provide the high calibre plant personnel required in the manufacturing of instruments and heating equipment. We realized that meeting the above conditions would be asking a great deal of any industrial property, but our Skokie property promises to satisfy our desires in every way."

HONEYWELL EXPANDS OPERATIONS

SOUTHERN California's rapid industrial and building development has been reflected in opening of a new and greatly-enlarged headquarters building by the Minneapolis-Honeywell Regulator Company in Los Angeles.

The new building, a modernistic structure at 2840 East Olympic Boulevard, will represent a completely integrated branch of the company, housing all divisions: heating and air conditioning controls, industrial, aeronautical, contractor, and jobber-dealer.

The enlarged central office was made necessary by an expansion of the Honeywell staff in California from seven persons to 24 in the last 18 months, Gavin S. Younkin, branch manager said.

It will provide complete facilities for installation of both pneumatic and electric heating and air-conditioning control systems.

Altogether the Honeywell company produces 3,000 different types and models of automatic control instruments which have 10,000 different applications in domestic, commercial and industrial heating, air conditioning and ventilation control; aviation, railroads, and steamships, and industrial process-control operations.

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AIR CONDITIONING EQUIPMENT

Delco and Wagner—Electric Motor Parts
26,000 Square Feet of Shop and Warehouse Space
Same Day Service—On Items in Stock
HERMETIC UNITS AND COMPRESSORS REPAIRED

SERVICE PARTS COMPANY
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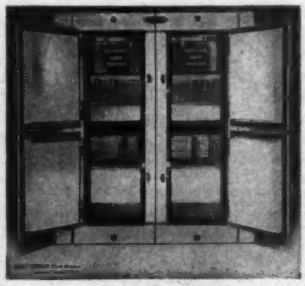

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Wilson ZEROSAFE Is Years Ahead

SINCE 1939 Enthusiastic public acceptance and constant daily use have proved Wilson ZEROSAFE the greatest Reach-In Farm Freezer in America. These years of trouble-free ZEROSAFE service are your guarantee that the new ZEROSAFE, now greater than ever before, will continue to revolutionize American eating habits by making frozen fresh foods a part of daily living.

There is a ZEROSAFE size for EVERY need. Self-Contained Models are of 15 and 25 cu. ft. capacities; Sectional Models from 22 cu. ft. to 120 cu. ft. Model illustrated is FF-44.

For franchise information address Desk 15

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Going back into Service Work ?

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J. P. B. FISKE DIES

JONATHAN P. B. FISKE, 81, who developed the frigidaire while serving as head of the Delco division of General Motors, and who later became general manager of the division handling that product, died Nov. 15 at Newton, Mass. He obtained several patents on the electrically-cooled ice cream cabinet.

TOM PHILLIPS WITH TESCO

TOM PHILLIPS, formerly of Automatic Products and Detroit Lubricator Company, is now associated with Tesco Distributors, wholesalers of Newark, N. J.

Ted Yecies, partner of the firm, announces this appointment in conjunction with the expansion plans of this organization.

CRUDE RUBBER IS AGAIN BEING USED FOR DOOR GASKETS

FOR some months past, Jarrow Products, Chicago, Ill., have been manufacturing and shipping gaskets made of crude rubber and giving their customers pre-war quality.

When the shortage of natural rubber compelled them to furnish gaskets made of reclaim, customers were advised that it was the first time in their business history that they were offering merchandise which they could not stand behind. All wholesalers were advised to buy on the basis of not over a sixty-day turnover and it was suggested they send smaller orders more frequently. At the Refrigeration and Air Conditioning Exposition in Cleveland recently, a few servicemen stopped at the Jarrow Products booth and complained about the quality of the reclaimed gasket which they were getting from their wholesalers.

If any of this gasket is on the shelves of any wholesaler, the gasket is now considerably over two and a half years old and it cannot give satisfaction to any of their customers.

The sale of this gasket to the serviceman will not benefit his customer and, by the same token, will not benefit his reputation nor his wholesaler's. This gasket should not be in any wholesaler's stock. If there is any reclaim gasket in stock, steps should be taken to eliminate it so that no more can get into your customers' hands.

This is a serious matter for the reputation of everybody concerned and if there are any problems along this line, Jarrow Products request that you take them up with them at once.

NEW CATALOGS AND BULLETINS

ALCO VALVE COMPANY, St. Louis, Mo., have just issued a new 17-page catalog No. 18. The catalog contains listings of Alco Valve products, specifications, and convenient to use capacity tables for their various types of expansion valves. Included with the catalog is a file sheet of authorized Alco wholesalers and Alco branch offices and where they are located.

SERVEL, INCORPORATED, Evansville, Indiana, have just issued a new brochure on their complete line of Supermetic units. Its 11 pages are descriptive of Servel production methods, production facilities and personnel of the Engineering and Sales Department. A bulletin was issued for use at the All-Industry Convention, where the complete line of Supermetic units was shown for the first time.

THE PHILADELPHIA THERMOMETER COMPANY, Philadelphia, Pa., have just issued a new 64-page catalog of thermometers and temperature measuring devices manufactured by them. All types of thermometers are illustrated in the catalog, together with specifications and probable application. Price list is included in separate sheets at the back of the catalog.

WHITE-RODGERS, St. Louis, Mo., have issued a new indexed catalog of light and heavy duty thermostats, fan and limit controls, primary oil burner controls, stoker controls, relays, industrial oven controls, hot water and steam controls, refrigeration controls, damper motors, gas valves and safety pilots. The catalog is sectionalized and index tagged for convenient reference, and is bound in a black loose leaf binder. It contains all necessary equipment data, including specifications, dimensions, applications, installation, setting and adjustment and wiring diagrams.

GENERAL CONTROLS CO., 801 Allen Avenue, Glendale, Calif., have just issued a new catalog of automatic controls for gas, oil, water, air, steam and refrigerants and other fluids. It is a 52-page book, showing complete specification and installation data on each control. It contains considerable reference material in table form, useful to the sales and installation field. Copies may be secured from General Controls Co.

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Our organization welcomes your cooperation and support in the preparation of a training program to serve your particular requirements. Let us solve your employment problem.

OUR GRADUATES ARE AVAILABLE FOR SERVICING, INSTALLATION, SALES and Junior Engineering work.

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Domestic Cold Controls (Modern Type)	$2.00
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Commercial Dual Controls	3.00
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Cold Controls • Pressure Switches
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BETTER BUYERS SPECIFY SHANK DEHYDRATORS

Refrigeration men who know specify Shank Dehydrators because they are low in cost, light weight, modern design with leak proof joints.

ELIMINATE REFILLING

The low cost of Shank Dehydrators makes it more economical to replace used dehydrators than to refill.

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Your refrigeration—heating—air conditioning equipment and supply jobber in
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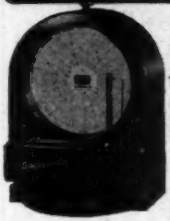
For TEMPERATURE / For MOTOR OPERATION
2 Recorders For Less Than The Price of One*



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Bulletin 704 gives list of ranges, practical application data, and complete details.

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GASKETS

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More power, because the AUTO-DIESEL Helicam Piston Ring fits accurately and is really GAPLESS. Stops blow bys. Holds the high Diesel compression necessary to smooth, full flow of power. Tension . . . flatness . . . circularity and close dimensional limits assure perfect seal. Sizes 1" to 35" . . . for original equipment or replacement in Diesel units, and for hydraulic and pneumatic equipment. Used also for oil rings . . . for contracting rings for sealing shafts, bearings etc. We also make conventional type rings.

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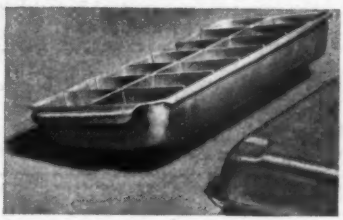

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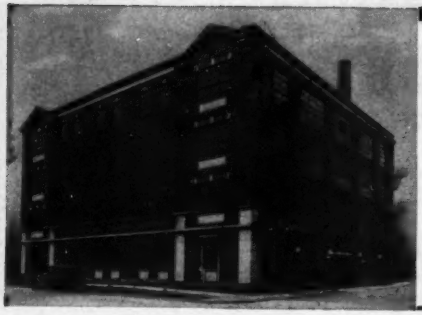

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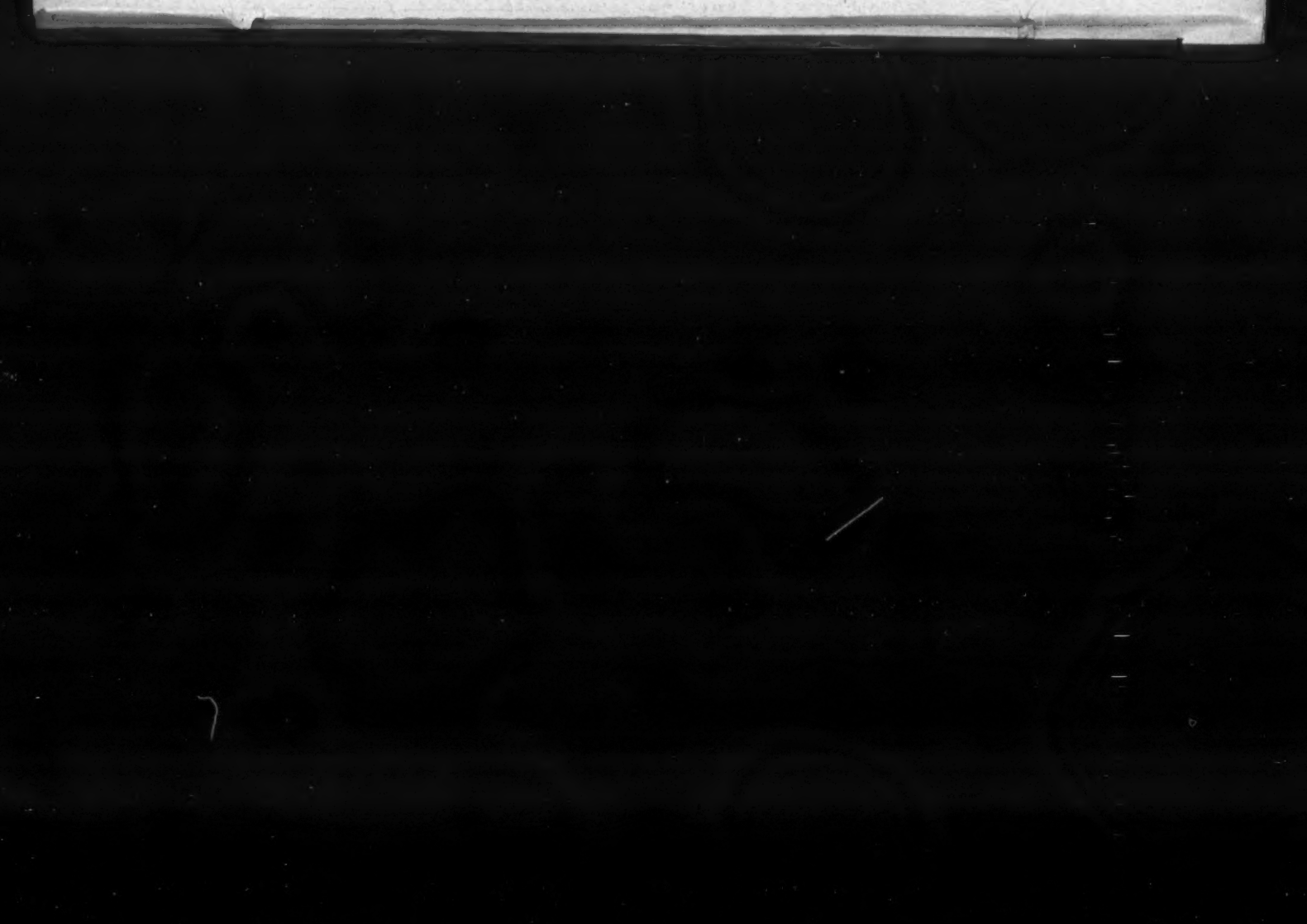

VOLUME INDEX

January to December, 1946 — **Volume Fourteen**

TO facilitate the location of articles which have appeared in THE REFRIGERATION SERVICE ENGINEER, this index is a regular feature in each December issue, serving as a ready reference of the articles and subject matter which have appeared in the preceding twelve issues. The figure following the date of issue refers to the page on which the article will be found.

A

Adapting the Summer Air Conditioner to Winter Use, *by Edward Dowis*.....Nov.—25
Air Conditioned Bus Meets Approval.....Mar.—46
Conditioner, Measuring Output of, *by Edward Dowis*.....Oct.—43
Conditioning at $1.27 per Month.....Feb.—50
Conditioning for Trinidad Army Post...Feb.—43
Conditioning Systems, Charging and Starting, *by J. N. Calhoun and F. M. Mayse*.....Dec.—31
Airtemp Conditioners, Installation and Operation of.....Jan.—40
All-Industry Refrigeration and Air Conditioning Exhibition.....Oct.—60
Exhibitors at.....Jul.—54, Oct.—68
Displays You Will See at.....Sept.—52
Makes History.....Nov.—47
ASRE Committee Named to Accredit Technical Institutes.....Jul.—47
Holds 41st Annual Meeting.....Jan.—82
Spring Meeting of.....Jul.—54
Appliance Dealer Outlets Overexpanded...Nov.—62
Apprenticeship Standards.....Jan.—26

B

Book Review:
Electric Motor Repair.....Nov.—66
Establishing and Developing a Refrigeration Service Business.....Dec.—52
Sept.—28, Oct.—34, Nov.—28, Dec.—42
The Refrigeration Industry.....Nov.—66
Trane Air Conditioning Manual.....Nov.—64
Bull Session, *by Donald Daly*.....Sept.—30
Business, Getting Down to, *by Waylan Clarke*.....Jun.—34, Jul.—30, Aug.—30, Sept.—28, Oct.—34, Nov.—28, Dec.—42

C

Capacitors, Replacement of Electrolytic Motor Starting, *by Louis Kahn*.....Jun.—37
Chapman, C. H., Wins Houston Tube Bending Contest.....Feb.—50
Charging and Starting Air Conditioning Systems—*by J. N. Calhoun and F. M. Mayse*.....Dec.—31
City of Chicago Code Additions Costly to Refrigeration Industry.....Mar.—29
Clean Air.....Aug.—50
Climatic Hangar Nears Completion.....Mar.—70
Code, Chicago, Additions Costly.....Mar.—29
Dayton, Proposed New.....Aug.—34
Los Angeles, New.....Jun.—36
Coldspot Home and Farm Freezers, Construction, Operation and Servicing....Dec.—36
Copper and Copper Products.....Jul.—46
Cylinder Shortage Is Bottleneck.....Oct.—76

D

Designing Air Conditioning to Create Future Sales, *by Herbert Hanley*.....Aug.—44
Dimension Standards for Small Motors...Dec.—50
Drug Stores Offer Big Market for Refrigeration, *by Louise Bruner*.....Jun.—29

E

Electric Instruments—Principles of Operation, *by G. F. Gardener*.....Jan.—32, Feb.—29, Mar.—37, Apr.—34, May—30
Ethyl Chloride, Refrigerated Bottling, *by James Clyde Porter*.....Sept.—36
Evolution of a Service Mechanic, *by Donald F. Daly*.....Feb.—27
Exhibitors at All-Industry Exhibition.....Oct.—68

F

First Annual Meeting of NARC.....Nov.—52
Fishkeeper, a Serviceman Designs the.....May—34
Food Refrigeration Field One of Seven Best Opportunities.....Feb.—44
Fourth All-Industry Exhibition.....Oct.—60
Makes History.....Nov.—47
From $3000 Capital to $350,000 Yearly Gross, *by James Clyde Porter*.....Apr.—23
From Tool Kit to Thriving Business in Eight Years, *by Wm. H. Morrison*.....Jul.—33
Frozen Doughs Features New Frozen Foods Store, *by Herbert Hanley*.....Sept.—50
Food Equipment, 200 Firms Making.....Jan.—50
Industry, Some Facts on.....Feb.—47
Leading Schools Experimenting with....Jan.—62
Mfgrs. and Suppliers Assn.....Oct.—66
Pantry on Wheels.....Sept.—38
Freon, Strike Curtails Supply.....Dec.—52
Frozen Pastries Offer Good Field for Refrigeration Engineer, *by Robert A. Latimer*.....Jul.—38
Future Home Designed for Year Round Air Conditioning, *by Fred A. Herr*...Sept.—32

G

Getting Down to Business, *by Waylan Clarke*.....Jun.—34, Jul.—30, Aug.—30, Sept.—28, Oct.—34, Nov.—28, Dec.—42
G.I.'s Service Shop on Wheels.....Jul.—40

GOVERNMENT BUREAUS—NEWS AND RULINGS:

Adjustable Pricing Allowed for Makers of Some Electric Units.....Jun.—54
Ceiling on Used 1946 Domestics.....Oct.—88
Price Increase on Repair and Replacement Parts.....Jun.—52
Price Modified on Small Compressors...Jun.—54
First Effects of O.P.A. Extension....Aug.—52
Five Per Cent Increase Allowed on Non-electric Controls.....May—44
Household Refrigerator Ceilings Raised.Jun.—54
June Production Up.....Aug.—52
Limit on Material Inventory.....Aug.—50
Motor Makers Assisted.....Jul.—47
Nebraska Firms Approved for On Job G.I. Training.....Mar.—50
O.P.A. Controls Eliminated.....Nov.—23
On Job G.I. Training.....Apr.—47
To Be Controlled by VA.....May—45
Pay Rise Is not Basis for Ceiling Increase.....Mar.—50
Preference Ratings.....Sept.—56
Price Increase on Controls.....Jun.—52
Price of Refrigerators to Increase.....Sept.—58
Records Required Under OPA Must Be Preserved.....Aug.—47
REA Approves Loans.....Aug.—47
Service Firms Can Increase Charges....Jun.—52
Wholesalers and Retailers Formulas Under Freeze Ceilings.....Oct.—88

H

Higgins Presents Business to Operating Heads ..... Jan.—60
Hotels to Spend 101 Million for Refrigeration and Air Cond. ..... Jan.—39

I

Ice Cream Hardening Room ..... Aug.—27
Indexed Inventory System ..... Jan.—30
Installation and Operation of Airtemp Conditioners ..... Jan.—40
Institute of Refrigeration and Air Conditioning, York Opens ..... Mar.—47
Insulation for Fruit & Vegetable Storages, *by S. C. Martin* ..... Mar.—23
Invoice File Eliminates Profitless Callbacks, *by Herbert Hanley* ..... Jan.—52

K

Kruse Refrigeration Service Builds Modern Place of Business ..... Jan.—58

L

Large Appliance Market Seen in New Orleans ..... Jan.—53
Leading Schools Experimenting with Frozen Foods ..... Jan.—62
Let's Help Him Get Started, *by Felix Wierman* ..... Jan.—25
Teach Him the Trade, *by Donald Daly* .. Apr.—32
Locker Plant Breakdown Given ..... Jul.—52
Plants, Preventive Maintenance for, *by Paul Reed* ..... Nov.—56
Los Angeles Code Complete ..... Jun.—36
Low-Temperature Refrigeration, *by F. R. Zumbo and Terry Mitchell* ..... Feb.—23, Mar.—34, Apr.—29
Lowdown on the Low Side, *by Francis Frazee* ..... May—29

M

McLaughlin Combines Mfg., Sales, Service ..... Feb.—36
Measuring the Output of an Air Conditioner, *by Edward Dowis* ..... Oct.—43
Midget Cooler for Planes ..... Apr.—41
Midwest Wholesalers Meet ..... Jul.—84
Mobile Refrigeration, Opportunity for Servicemen in ..... Oct.—29, Nov.—33
Motors, Dimension Standards for Small ... Dec.—50

N

Natl. Assn. of Refrigeration Contractors ... Oct.—64
First Annual Meeting of ..... Nov.—52
Frozen Food Locker Assn. ..... Oct.—66

NEW AND IMPROVED APPLIANCES:

Admiral Dual-Temp Refrigerator ..... Jan.—54
Air Conditioner ..... Oct.—92
Airfoil Fan ..... Aug.—76
Alco Thermo-Limit Valve ..... May—68
All Metal Hammers ..... Feb.—74
American Farm & Home Freezer ..... May—84
Appliance Tester ..... Jul.—76
Artic-Temp Sub Zero Locker ..... May—76
Belt Splicer ..... Jul.—76
Ben Hur Freezer ..... Nov.—84
Bottle Vendor ..... Jul.—78
C-Leak ..... Dec.—70
Caravan Top ..... Oct.—92
Carbide Drill ..... Aug.—78
Chexit ..... Jun.—74
Coil Winder ..... Jul.—78
Coldaire Food Chest ..... Mar.—74
Home Freezer ..... Mar.—74
Cold-Run Resin Glue ..... Sept.—76
Commercial Water Cooler ..... Mar.—76
Condensing Unit ..... Nov.—84
Cooler, Beer ..... Nov.—84
Curvette ..... Dec.—66
D-C Converter ..... May—70
Dewpoint Recorder ..... Jul.—46
Diaseal Valves ..... Dec.—68
Display Cabinet ..... Jul.—78
Electro-Cell ..... Apr.—74
Eskimo Freeze ..... Nov.—82
Flexible Shaft Tool ..... Jun.—74
Flex-Lites ..... Dec.—68
Fountain Equipment (Liquid Carbonic) . Mar.—72
Freeze Warden ..... Dec.—70
Freezer-Icemaker ..... Dec.—66
Frosted Food Cabinet ..... Nov.—86
Germicidal Lamp ..... May—68
G.E. Alarm ..... Dec.—66
Grove Check Valve ..... Mar.—72
Hand Truck ..... Aug.—76
Heat-O-Meter ..... Feb.—76
Henry Gauge Set ..... Apr.—72
Hill Frosted Food Case ..... Sept.—78
Hose Couplings ..... May—68
Hydraulic Lift Tailgate ..... Jan.—84
Iceberg Frozen Food Locker ..... Jan.—84
International Harvester Home Freezer .. Mar.—82
Jack & Heintz Hermetic Compressor .. Sept.—82
Jiffy Sketch ..... Nov.—86
"Kant-Mar" Hammer ..... Jun.—76
Kelvinator Freezer ..... Nov.—80
Klixon Thermostat ..... Jul.—76
Liberty Ratchet Drill-Driver ..... Apr.—72
Liquid Carbonic under counter Refrigerator ..... Sept.—76
Liquid Pump ..... Oct.—90
Midget Lamp ..... Oct.—90
Safety Head ..... Jan.—84
Mighty Mite ..... Sept.—76
Nu-Braze Wonderflux ..... Feb.—74
Oasis Water Cooler ..... May—70
Operations Recording Device ..... Aug.—78
Orley Freezer ..... Jun.—78
Packaged Air Conditioning ..... Jul.—78
Penn Control ..... Dec.—70
Permagrip Fasteners ..... May—70
Philco Conservador Refrigerator ..... Jan.—54
Freezer, Chest Type ..... Jan.—56
Upright ..... Jan.—56
Pipe Clamp ..... Dec.—68
Pipe Insulation ..... Jun.—74
Joint Compound in Stick Form ..... Mar.—72
Plastic Hammers ..... Dec.—68
"Reynalite" ..... Jun.—76
Rotary Broaches ..... Aug.—76
Rubber Lid ..... Aug.—78
Sectional Farm Freezer ..... Jan.—84
Shaper ..... Nov.—82
Space Air Conditioner ..... Jun.—78
Split Bolt Connectors ..... Jun.—78
Strainer-Filter-Drier Combination ..... Apr.—72
Temperite Recorders ..... May—72
Terminal Leaks Solved ..... May—70
Sealing Cap ..... Jun.—76
Thermometer, Marsh ..... Nov.—82
Minneapolis-Honeywell ..... Nov.—80
Weston ..... Oct.—90
Thors Anti-Frost Compound ..... Feb.—74
Unit Starter & Analyzer ..... Mar.—74
Visoleak Charging Set ..... Apr.—74
Whiting Corp. Home Freezer ..... Sept.—80
Window-type Cooler Fan ..... May—72
Wyco Hy-Speed Saw ..... Apr.—74
New Book on Service Business ..... Jul.—47
Los Angeles Code Complete ..... Jun.—36
Refrigerators and Freezers Ready ..... Jan.—54
York Y.M.C.A. Schools Expand Courses . May—46
Nomenclature Standardization ..... Aug.—46

O

On-the-Job Training for Servicemen, Schedule of ..... May—35
Opportunity for Servicemen in Mobile Refrigeration ..... Oct.—29, Nov.—33
Our Responsibilities to the Newcomer in the Service Field ..... Jan.—21
Overpowering of Commercial Units in Hot Valley Builds Future, *by Robert Latimer* ..... Jan.—51
Owners Need More Information of Repairs, Survey finds ..... Jun.—56

INDEX OF ILLUSTRATIONS

A

Air Conditioning and Cleaning Units...Sept.—35
All-Industry Exhibits.....Nov.—43-44-45
Registration Lobby.....Nov.—47
Alter Co., Harry, Order Dept.....Apr.—84
ASRE New Officers.....Jan.—82
American Sporting Goods Co.....Aug.—44
Anemometer.....Oct.—44
Ansul Chemical Co. Sales Meeting.....May—78
Applying Capacitor Selector.....June—38

B

Bendix Friez Radiosonde.....Apr.—29
Radio Div. Test Plant.....Apr.—30-31
Bortz Fishkeeper Views.....May—34

C

California Refrigerator Co. Oakland Store. Nov.—88
San Francisco Store.....June—80
Carter Sales & Service Radio Dept.....Aug.—37
Cartoons:
E-Z Freeze Locker.....June—45
"Every Time I Walk By".....Aug.—47
"Guess I Made My Price Too High"....May—46
"I Didn't Understand What You Meant by Your Refrigerator Leaking".....July—42
"I don't Care How Much the Ice Co. Pays You".....Apr.—43
"I'm Thinking of Expanding a Little"..Mar.—41
"Needs Oiling, don't she".....Nov.—38
"That's the Refrigerator Fellow Who Left Butter Out".....Feb.—39
"This is One of our Finest Specimens"..Oct.—58
Central Refrigeration Wholesalers Assn. New Officers.....Mar.—88
Chapman, C. H., Receives First Prize....Feb.—50
Console Refrigerator.....Sept.—33

D

DIAGRAMS AND DRAWINGS:
Air Conditioned Bus.....Mar.—46
Anesthesia Machine.....Apr.—38
Circulated Brine System.....Aug.—29
Connection to Inclined Coil.....Nov.—27
One Pipe Riser.....Nov.—26
Dial Indicator.....Apr.—42
Draining Loop in Steam Line.....Nov.—27
Evaporative Condenser.....Oct.—41
Flow Diagram.....Feb.—25
Frigidaire Master Model 6-34 System...Aug.—41
Frozen Food Pantry Floor Plan.....Sept.—39
Fruit and Vegetable Storage Room.....Mar.—26
High Side Float Circulator System....Aug.—43
Home Freezer Index Sheet.....Jan.—30-31
Ice Cream Hardening Room Plan.....Aug.—27
Indirect Heat Pump System.....Mar.—33
Laboratory for U. S. Army.....Feb.—24
Measuring Capacity and Power Factor..June—39
Multiplexing Condensing Units.....Apr.—41
Permagrip Fasteners Construction.....May—70
Petot Tube and Manometer.....Oct.—44
Plate Arrangements for Home Freezers.July—32
Prony Brake.....July—45
Proportioning Valve Connection.....Nov.—27
Providing a Cushion in Water Lines...June—44
Pump-Up Bench.....May—39
Refrigerant Drum Stand.....Sept.—44
Refrigerating System for Trucks.....Nov.—36
Refrigeration Cycle, Basic.....Mar.—30
Reverse.....Mar.—31
Seal Ring Tool.....July—41
Service Forms.....Apr.—25-26, July—36-37
Shop Layout.....Aug.—38
Strainer for SO_2 System.....Nov.—37
Thermometer.....Feb.—24
"U" Tube Manometer and Single Jet...Oct.—45
Volt-Ammeter.....Nov.—37
Wiring Diagrams for Majestic.....Aug.—54-56-58, Sept.—45-46-47
Dynameter Instrument.....Feb.—29

E

Electrodynamic Wattmeter.....Apr.—35
Emergency Capacitor.....June—38-39
Equipment at Trinidad Army Post.....Feb.—43
Used for Drying Penicillin.....Feb.—25
Ethyl Chloride, Coil used for Storing.....Sept.—36
Condensing units for Transferring.....Sept.—37
Storage Drums.....Sept.—36

F

Food Machines Owner and Employees....June—33
Four Vets Back on Job.....May—74
Franklin Refrigerated Trailer.....Nov.—34

H

Hagenan & Son Delivering Freezer.....Nov.—60
Herman Goldberg Party.....Jan.—66
Honeychurch, W. A., and M. W. Knight..Mar.—84

I

Industries Sales Corp. Owners.....Jan.—60
Insulated Fruit and Vegetable Storages.....Mar.—24-25-27

K

Knight, M. W., Inspecting Equipment....Apr.—80
Kold-Hold Field Representatives.....Feb.—86
Kruse' Place of Business.....Jan.—58-60

L

Leonard Cleanable Evaporator.....May—41
Liquid Chicago Service School.....Sept.—80
Los Angeles Postwar House.....Sept.—32

M

Marine Refrigeration.....July—25
McLaughlin's Planned Addition.....Feb.—36
Walk-in Cooler.....Feb.—37
Measuring Air Output of Grill.....Oct.—43
Minneapolis-Honeywell Toronto Plant.....May—82

N

NARC Directors and Officers.....Feb.—45
New Officers.....Nov.—52
Nelson Co., N. O., Supplies Dept.....May—50
NEW AND IMPROVED APPLIANCES:
Admiral Dual-Temp Refrigerator.....Jan.—54
Aerial Flow Fan.....Aug.—76
Air Conditioner, American Coils Co....Oct.—92
General Engrg. & Mfg. Co.....June—78
Pacific Mfg. Corp.....July—78
Airserco Analyzer.....Mar.—74
Alco "Thermo-Limit" Valve.....May—68
American Farm and Home Freezer.....May—84
Appliance Testing Instrument.....July—76
Arctic-Temp Sub-Zero Locker.....May—76
Beer Cooler.....Nov.—84
Belt Splicer.....July—76
Ben Hur Freezer.....Nov.—84
Biltwell Merchandizer.....July—78
Caravan Top.....Oct.—92
Carbide Drill.....Aug.—78
Check Valve for Coldspot.....June—74
Coldaire Home Freezer.....Mar.—74
Combination Strainer-Filter-Drier.....Apr.—72
Condensing Unit.....Nov.—85
D-C Converter.....May—70
Dumore Flexible Shaft.....June—74
Electronic Air Filter.....Apr.—74
Eskimo Freeze.....Nov.—82
Frosted Food Cabinet.....Nov.—86
Gauge Glass Set.....Apr.—72
Grove Check Valve.....Mar.—74
Hammers for Welding.....Feb.—74
Heat Calculator.....Feb.—76
Hill Frosted Food Case.....Sept.—78
Hussmann Frozen Food Case.....Jan.—74
Hydraulic Lift Tailgate.....June—84
Iceberg Frozen Food Locker.....Jan.—64
International Harvester Home Freezer..Mar.—82
Jack & Heintz Compressor.....Sept.—82
Jiffy Sketch.....Nov.—86

"Kant-Mar" Hammer....June—76
Kelvinator Freezer....Nov.—80
Klixon Thermostat....July—76
Liquid Carbonic Fountain Units....Mar.—72
Under Counter Refrigerator....Sept.—76
Liquid Pump....Oct.—90
Marsh Thermometer....Nov.—82
Midget Ultraviolet Sterilamp....Oct.—90
Mighty Mite....Sept.—76
Minneapolis-Honeywell Thermometer....Nov.—80
Mystik Dri-Pipe....June—74
Orley Freezer....June—78
Philco Chest Type Freezer....Jan.—56
Refrigerator....Jan.—54
Upright Freezer....Jan.—56
Pressure Relilef Device....Jan.—84
Ratchet Drill Driver....Apr.—72
Refrigerator Truck....Aug.—76
Rotary Broach....Aug.—76
Rubber Cabinet Lid....Aug.—78
Safety Seal Coupling....May—68
Sanilite Lamps....May—70
Sealing Cap for Crosley Terminals....June—76
Shaper....Nov.—82
Split Bolt Connectors....June—78
Tempscribe Recorder....May—72
Visoleak Charging Set....Apr.—74
Water Cooler, Oasis....May—72
Potter & Rayfield....Mar.—76
Weston Thermometer....Oct.—90
Whiting Home Freezer....Sept.—80
Window Fan....May—72
Wyeo Saw....Apr.—74

P

Pastry Freezing Cabinet....July—38
Pa. State College Experimental Box....Feb.—26
Portable Workshops....Jan.—30
PORTRAITS:
Allen, C. C....May—82
Allison, W. W....Oct.—53, Nov.—40
Anderson, A. H....June—86
Anderson, L. C....Oct.—64
Anderson, M. A....May—78
Anglin, W. E....Dec.—76
Ayres, R. W....Oct.—55, Nov.—41
Baker, A. L....Jan.—92
Baragar, J....Apr.—80
Beals, Norman....June—84
Bensen, C. L....Feb.—90
Benson, C. H....Apr.—44, Oct.—60
Benson, E. T....Oct.—55, Nov.—41
Berger, J. V....June—82
Boepple, G. J....Feb.—88
Bolton, Frances P....Nov.—41
Borah, J. B....June—84
Brown, A. L....Aug.—80
Buschkopf, C....Oct.—52
Bush, John K....Oct.—54
Campbell, C. M....July—88
Churchill, G. A....Apr.—78
Coon, Robert....Apr.—76
Davis, W. L....May—84
Davis, W. P....Apr.—80
Davison, B. C....May—74
Dinges, H. R....Aug.—86
Donovan, J. J....Feb.—90
Doyle, C. J....Oct.—52, Nov.—40
Dresback, Mrs. G. W....Oct.—55
Driskell, J. L....Oct.—53, Nov.—40
Duvall, F. M....Feb.—82
Eastburn, W. H....Aug.—86
Edelstein, Nathan....July—82
Evans, W. H....May—82
Farr, W. W....Oct.—54-64
Fenwick, A. M....Oct.—54
Flannery, E. M....Apr.—44
Garland, S. B....Oct.—52
Glou, Ted I....Apr.—45, Oct.—62, Nov.—50
Goddard, M....Oct.—55, Nov.—41
Gray, H. D....May—78
Gray, R. D....June—88
Harris, C. C. E....Nov.—40
Hendrick, H. J....Feb.—84
Henry, Guy J....Apr.—44, Oct.—60
Hildreth, H. F....Oct.—55, Nov.—41
Hills, A. H....Feb.—80
Holcombe, A. H., Jr....Apr.—46, Oct.—62
Horner, S. D....July—88
Hudzietz, C. W....Jan.—94
Iams, Hill.s....May—84
Irving, W. C....Oct.—55
Jahnke, G. T....Aug.—84
Jamison, J. V....Apr.—86
Jamison, M. M....Oct.—64
Johnson, R. A....Nov.—90
Kelley, H. M....Nov.—62
King, E. F....Oct.—94
Koch, Harold J....July—33
Krack, W. H....May—76
Kruse, V. R....Nov.—41
Law, J. E....Apr.—86
Lawson, Charles T....Jan.—90
Layport, E. T....May—76
Lige, W. W....June—86
MacBride, W. G....Nov.—45
Malcolm, H. A....Sept.—82
Marshall, W. J....Oct.—53, Nov.—40
Mayfield, W. C....Feb.—80
McCarthy, Mrs. R. C....Nov.—46
McDermott, H. T....Oct.—53, Nov.—40
McGill, A. D....Oct.—53
McIlvaine, D. K....Aug.—84
Meiklejohn, M. J....Apr.—82
Miller, E. J....July—80
Money, R. H....Mar.—90
Nussbaum, O. J....Nov.—90
Olin, C. J....Nov.—90
Otterson, C. D....Nov.—88
Overman, Mrs. A. W....Oct.—58
Palen, A. M....Oct.—54-64
Park, J. F....Oct.—64
Penny, Prudence....Nov.—74
Philipp, Dr. L. A....Mar.—78
Pierce, Cal....May—86
Price, E. A....Mar.—86
Rainbault, J. P....June—88
Reed, Paul B....Oct.—55, Nov.—40
Reina, Theo. A....July—82
Roberts, H. R....Sept.—80
Robinson, G. S....June—80
Roche, Geo. J....Oct.—62
Rubenson, J. W....Aug.—82
Schafer, W. R....Nov.—88
Scholl, B. J....May—86
Segal, S. C....July—82
Seibel, R. R....June—84
Siebert, E. A....Oct.—55
Spall, E. G....Apr.—78
Spoehrer, H. F....Apr.—44, Oct.—60, Nov.—30
Stafford, Willis....Oct.—55, Nov.—41
Stamps, H. F....Apr.—86
Steege, H. J....Oct.—94
Stern, Harold G....May—26, Oct.—62
Strachan, J. A....May—80
Summer, E. A....Oct.—53
Theobald, O. J....Aug.—86
Thorndike, K. B....July—54, Oct.—60
Tilson, F. O....Aug.—86
Tressler, Dr. D. K....Nov.—41
Tyler, Jerry....July—86
Wallace, H. F....Oct.—94
Werb, B. F....Apr.—78
Weston, G. W....Nov.—54
White, R. O....Jan.—86
Willhoft, Carl....Oct.—94
Winchester, W. L....Apr.—76
Wright, E. S....Oct.—64
Wright, Leonard, Jr....Feb.—82
Precipitron Electric Dust Remover....Aug.—45
Preparing Foods for Freezing....Aug.—32

R

Refrigeration Components Staff....Sept.—30
Engineering, Inc., New Plant....Oct.—94
Equipment Co. Classes....Apr.—27
Spray Booth....Apr.—28
REMA Directors....Apr.—44
and REWA Joint Luncheon....Nov.—46
REWA Officers and Directors....Apr.—46
Registration Booth at Exhibition....Nov.—47
REFRIGERATION SERVICE ENGINEERS SOCIETY:
Ann Arbor Group at Mich. State Assn..May—60
Annual Banquet....Nov.—42
Azalea City Group....July—60

P

Packaging Foods before Freezing.....Aug.—32
Photographers, Refrigeration for.....Mar.—51
Pipe Thread Compound, Requisite of a Good, *by I. H. Grancell*.....May—36
Plate Arrangements for Home Freezers....Jul.—32
Preventive Maintenance for Locker Plants, *by Paul B. Reed*.....Nov.—56
Problems in the Use of Water-cooled Condensers, *by Ralph M. Westcott*...Oct.—37
of the Day, *by Herman Goldberg*.....May—43
Progressive Wholesaler Adopts Plan of Package Unit Sales to Servicemen, *by C. M. Littlejohn*.....May—25
Proposed New Code for Dayton.....Aug.—34

Q

QUESTIONS AND ANSWERS:
Air Conditioning Installation.....Jun.—47
Aluminum Fittings.....Jun.—46
Analysis of Sludge in System.....May—40
Banana Ripening.....Oct.—47
Beal Freezer Valve Freezes.....Nov.—31
Bonding Tubing to Liners.....Feb.—41
Calculations for Vegetable Storages....Mar.—43
Cannot Find Leak.....Jun.—47
Capacity of Model K Frigidaire.....Jun.—47
Changing Refrigerant.....Jul.—44
Cherry-Burrell Freezer.....Jul.—43
Choosing the Refrigerant.....Sept.—40
Cleaning Low Side Float.....Feb.—40
Majestic Systems.....Apr.—40
Coldspot Inefficient.....Aug.—39
Combination Water Cooler and Beverage Cooler.....Jan.—46
Comments on Question 721.....Mar.—42
Question 726.....May—38
Question 744.....Aug.—39
Question 748.....Jul.—43
Condensing Unit Rating.....Sept.—40
Converting from Ice.....Mar.—44
Correction to Question 759.....Oct.—47
Cracking Noise in Norge.....Nov.—30
Crankshafts Break Repeatedly.....Dec.—44
Direction of Belt.....Jul.—43
Florist Box.....Oct.—48
Freezer Operation.....Nov.—30
Frigidaire Master 6-34.....Aug.—40
Sticks Up.....Oct.—47
Frosting Return Line.....Mar.—44
G. E. Top Mounted Unit.....Jan.—44
Grunow Evaporator.....Oct.—47
Unit.....Jan.—45
Head Pressure with Evaporative Condensers.....Jan.—44
High Head on Ammonia.....Sept.—41
Pressure.....Nov.—31
How Much CO_2 in a Container?.....Apr.—40
Ice Cream Cabinet Runs Continuously..Nov.—32
If I were Starting Business.....Jun.—50
Information Please.....Jan.—45
Iodine Odor in Cubes.....Nov.—30
Kelvinator Standard Equipment.....Nov.—32
Liquid Circulated with Different Metering Devices.....Aug.—39
Meat Discolors in Cooler.....Feb.—42
Milk Cooling.....Feb.—40, Dec.—44
More on Question 733.....Apr.—39
Multiplexing Condensing Units.....Apr.—40
Norge Rollator Pressure.....Jun.—46
Plans of Compensation.....Mar.—42
Pressure Increases When Thawzone is Added.....Feb.—42, Apr.—39
Removing Oil.....Jul.—44
Selecting Capacitors.....Jun.—46
Surge Tank Needed.....Apr.—40
Temprite Cooler Freezes.....Jun.—46
Testing Motors.....Jul.—44
Unit Bounces.....Dec.—45
What is a Reciprocal?.....Aug.—40
Size Capillary?.....Feb.—41
to do about Neoprene Rings When Baking Compressors?.....Mar.—43
Where Does Oil Go?.....Sept.—41

R

Refrigerants—Physical & Refrigerating Properties, *by Guy R. King*..Jan. 36, Feb.—32
Refrigerated Bottling Ethyl Chloride, *by James Clyde Porter*.....Sept.—36
Refrigeration and Air Conditioning Market Studies Begin.....Sept.—56
and Air Conditioning, Shipments of.....Jul.—56
Being Used on Assembly of New Cars..Jun.—56
Contractors Complete Organization.....Feb.—45
Group Growing.....Apr.—50
REMA Accepts 100th Member.....Sept.—56
Holds 4-day Meeting.....Apr.—44
REWA Has Record Attendance for 11th Meeting.....Apr.—45
Ready for Cleveland.....Oct.—62
Refrigeration for Controlled Cold Anesthesia, *by W. C. Heffernan*.....Apr.—37
for Photographers.....Mar.—51
in Germany.....Feb.—47
Low Temperature, *by F. R. Zumbo* and *Terry Mitchell*....Feb.—23, Mar.—34, Apr.—29
Reverse Cycle, *by Gardner C. Savage*..Mar.—30
REFRIGERATION SERVICE ENGINEERS SOCIETY:
Akron Chapter.....Apr.—58
Alabama State Meeting.....Jan.—70
Bakersfield, Calif., Forming Chapter....May—52
California RSES Assn. Formed.....Mar.—54
Holds First Annual Meeting.....Jun.—60
Canton Applies for Charter.....Aug.—60
Chapter Notes..Jan.—74, Feb.—62, Mar.—60, Apr.—62, May—56, Jun.—68, Jul.—66, Aug.—66, Sept.—68, Oct.—78, Dec.—62
Chapters in the Making.....Jul.—66
Cleveland Chapter Celebrates Tenth Anniversary.....Apr.—52
Set for Big Convention.....Sept.—62
Goldberg, H., Annual Party..Aug.—60, Sept.—60
Christmas Party.....Jan.—64
Greensburg Chapter Receives Charter..Mar.—52
Head of the Lakes Chapter Being Formed..Mar.—60
Hussmann-Ligonier to Feature St. Louis Chapter Meeting.....Jan.—74
Illinois Assn. Board Meets to Plan Convention.....Jul.—62
9th Convention.....Sept.—64, Nov.—68
Iowa State Assn. Formed.....Oct.—78
La Crosse Chapter Being Formed.....Apr.—62
Ladies Auxiliary...Feb.—72, Jul.—74, Sept.—70
Lima, Ohio, Forming.....Apr.—52
Liquid Carbonic Sponsors Series of Meetings..Feb.—56
Logan, Utah, Organizes.....Apr.—52
Long Beach Chapter Annual Dinner Dance..Feb.—58
Los Angeles Chapter Meeting Features Home Economics Talk.....Nov.—74
Make Your Chapter Newsworthy if You Want Publicity.....Feb.—51
Miami Chapter Bereavements.....Sept.—60
Has Colorful Charter Night.....Jan.—72
Michigan State Assn. Formation Meeting.Dec.—56
New Chapter at Lake Charles, La.....May—52
Chapter in Orange County, Cal.....May—56
Chapters in the Making.....Feb.—60
Service Company.....Aug.—60
New Charters Presented.....Dec.—58
New England States Assn. Annual Meeting..Dec.—56
Niagara Frontier Chapter Christmas Party..Feb.—58
On to Cleveland, Says RSES.....Oct.—51
Orange County Gets Charter.....Jun.—68
Outstanding Educational Program for 9th RSES Convention.....Aug.—62
Past President Plesskott Receives Plaque...Nov.—76
Pueblo, Colo. Petitions for Charter.....Sept.—70
RSES Inaugurates Visual Educational Program.....Feb.—54
9th Convention "Tops".....Nov.—39
7th Annual Interprovincial Assn. Convention March 17-18.....Feb.—52
Conference Exceeds All Records.....Apr.—58

Springfield, Mo., Begins Organization.....Mar.—58, Apr.—62
Sunshine City Chapter Receives Charter.....Jan.—68
Tampa, Fla. Men Apply for Charter...Mar.—52
Twin Cities Picnic.....Jul.—58, Sept.—60
Utah Aggie Receives Charter.....Jul.—62
Wis. State Assn. Meeting.....Jan.—68, Feb.—52, Apr.—60
Refrigeration, Unexplained.....Jul.—39
Refrigerator on Every Floor.....Jan.—35
Shipments.....Apr.—47, May—45, Jul.—46
Solar.....Jul.—46
Suggested Pharmaceutical and Biological, *by W. C. Hefferlin*.....Aug.—28
Replacement of Electrolytic Motor Starting Capacitors, *by Louis Kahn*.....Jun.—37
Requisite of a Good Pipe Thread Compound, *by I. H. Grancell*.....May—36
Reverse Cycle Refrigeration, *by Gardner C. Savage*.....Mar.—30

S

Safety in Service Work, Some Aspects of, *by Martin G. Lane*.....Sept.—25
Sale and Service of Food Machines Proves Good Companion for Refrigeration, *by Stephen P. Lathrop*.....Jun.—32
Schedule of "On-the-job" Training.....May—35
Service Business, New Book on.....Jul.—47
Engineer, So You Want To Be a, *by Don Daly*.....Jan.—22
Firms Make Early Start Selling Winter Service, *by Herbert Hanley*.....Oct.—36
Mechanic, the Evolution of a, *by Donald F. Daly*.....Feb.—27

SERVICE POINTERS:

Alcohol in Expansion Valve.....Nov.—38
Bad Odor.....Jun.—44
BX Tube Bender.....Aug.—42
"C" Clamps are Useful Tools.....Jan.—47
Cap Screw Holder.....Jul.—42
Changing Refrigerants.....Feb.—38
Cleaning Seal Shaft.....Feb.—39
Closing Stripped Valve.....Jul.—41
Converting a "Leonard Cleanable" to Electric Refrigeration.....May—41
Drilling Glass.....Oct.—50
Eliminating Water Hammer.....Jun.—44
Emergency Suggestions.....Sept.—43
Grunow Pointer.....Aug.—42
Units.....Apr.—43
High Side Float Circulator Increases Efficiency.....Aug.—43
Homemade Volt-Ammeter.....Nov.—37
Hostess Adapter.....Oct.—49
How Do You Like Your Alcohol?.....May—41
to Cure the Grunow.....Mar.—40
Late Model Meter Miser Charging Valve.Dec.—46
Light and Fan Switch.....Oct.—50
Making a Dial Indicator.....Apr.—42
Oil Thrower Puller.....Dec.—46
$125.00 Mouse Trap.....Oct.—49
Plastic Indicator.....Jul.—41
Quick Acting Clamp.....Sept.—43
Ranco for Westinghouse.....Nov.—38
Refrigerant and Oil Funnel.....Aug.—42
Drum Stand.....Sept.—44
Removing Excess Oil.....Dec.—47
Refrigeration Door Seal.....May—42
Repacking Motors.....Apr.—42
Repairing Carrene Meter.....Jan.—47
Deep-Freeze Control.....Jul.—41
Model P1117 Norge Evaporators....Mar.—41
Superfex.....Oct.—50
Replacement of G. E. Control.....Mar.—40
Replacing Frigidaire Latch.....Jan.—50
Transformers with Capacitors in G. E. Motors.....Jun.—45
Seal Ring Tool.....Jul.—41
Shielding the Leak Detector.....Feb.—39
Short Cut to Hermetic Repair.....Sept.—43
Shot of Whiskey for Refrigerator.....Dec.—46
Soldering Kelvinator Evaporator.....Jun.—44
Strainer for SO_2 System.....Nov.—37
Suggestion on Norge Units.....Apr.—42
Super-Tough Soap Bubbles.....Jan.—50
Symptoms of Clogged Compressor Body Suction Line Screen.....Feb.—38
Temporary Solenoid Valve.....Nov.—37
Testing Compressors.....Aug.—43
Using Worn Out Motors.....Jul.—41
Wiring Gibson Unit.....Mar.—40
Serviceman Designs the Fishkeeper, *by Donald Delayen*.....May—34
Shipments of Refrigeration and Air Conditioning.....Jul.—56
So You Want to Be a Service Engineer, *by Don Daly*.....Jan.—22
Solar Refrigerator.....Jul.—46
Some Aspects of Safety in Service Work, *by Martin G. Lane*.....Sept.—25
Some Displays You Will See at the 4th All-Industry Exposition.....Sept.—52
Some Facts on Frozen Food Industry.....Feb.—47
Southern Service Shop Combines Services Successfully, *by Donald Delayen*....Aug.—37
Spring Meeting of ASRE.....Jul.—54
Strike Curtails Freon Supply.....Dec.—52
Suggested Pharmaceutical and Biological Refrigerator, *by W. C. Hefferlin*....Aug.—28

T

TABLES:

Approx. Total Capacity in Mfds. Required for Power Factor Correction.....Jun.—42
Capacitor Ratings for Capacitor Start Motors.....Jun.—41
Capacity in Microfarads Electrolytic Motor Starting Capacitors.....Jun.—40
Production Box Score.....Nov.—66
of Consumers Durable Goods for July.Oct.—88
Properties of Mixtures of Air and Saturated Water Vapor.....Oct.—46
Shipments of Equipment. Jan.-June '45, Jul.—56
Temperatures and Insulation Thicknesses for Storage of Fruits and Veg.....Mar.—28
Theaters Are Good Market for Air Conditioning Salesman.....Jan.—53
30,000 Locker Plants by 1950.....Feb.—28
Three-Zone Farm Refrigerator Designed...Jan.—62
Too Many Freezer Makers Will Glut Shrinking Market.....Dec.—41
$12,000,000 Worth of Marine Refrigeration, *by Donald F. Daly*.....Jul.—25
200 New Firms Making Frozen Food Equipment.....Jan.—50

U

Unexplained Refrigeration.....Jul.—39

W

Water Cooled Condensers, Problems in the Use of, *by Ralph M. Westcott*.....Oct.—37
Working Under Pressure with a Marine Trouble Shooter, *by Donald F. Daly*.....Aug.—25

Y

York Institute of Refrigeration Graduates First Class.....May—46
Opens Institute of Refrigeration and Air Conditioning.....Mar.—47

Beehive Annual Banquet....Nov.—72
Birmingham Dinner Dance....Jan.—70
California Assn. Group....June—62
Luncheon Meeting....June—62
Meets Gov. Warren....June—64
Officers and Directors....June—60
Receives State Charter....June—62
Canton Regional Receives Charter....Nov.—72
Charleston Receives Charter....Aug.—60
Chicago Banquet....Feb.—62
Cleveland Convention Committees....Nov.—43
Picnic....Nov.—74
7th Annual Christmas Party....Feb.—70
10th Aniversary Banquet....Apr.—54
Corn Belt Buys a Dinner....Mar.—60
Fairfield Co. Charter Presentation....Mar.—58
Flint Group at Mich. State Assn....May—60
Florida West Coast Banquet....Oct.—80
Grand Rapids Group....May—60
Head of the Lakes Charter Presentation..July—68
Honorary Life Membership....Nov.—42
Ill. State Assn. Officers....Jan.—78
Views....Nov.—70
Lansing Group....May—60
Long Beach Group....Feb.—66
Los Angeles Dinner....Nov.—76
Tube Bending Contest....Apr.—68
Miami Charter Presentation....Jan.—72
Officers....Jan.—72
Michigan State Assn. Visitors....May—60
Niagara Annual Christmas Party....Feb.—58
Ohio Slogan Winner....Nov.—42
Orange County Receives Charter....June—68
Saginaw Group....May—60
St. Louis Group....June—70
Springfield, Mo., Charter Presentation..July—72
Trenton Soldering Contest....May—56
Twin Cities Picnic....July—58
Utah Aggie Officers' Dinner....July—62
Western Massachusetts Dinner....July—74
Wisconsin State Annual Banquet....Apr.—60
Officers....Apr.—60
Wolverine Party Group....Feb.—64
Refrigeration Supplies Distributor New Quarters....Mar.—51
Refrigeration System, Transparent....Mar.—47
Refrigerative Supply Co., Portland, Ore...May—28
Store in Spokane, Wash....May—25
Rudd's Drug Store....June—29
Ryan Refrigerated Truck....Nov.—35

S

Schnacke, F. C., with Compressors....July—80
Senator Wherry Opening Exhibition....Nov.—47
Servel Supermatic off production lines....Jan.—86
Service Truck....July—40
Standgard-Dickerson Plant....Aug.—84
Steinman Electric Appliance Building....Oct.—48

T

Temperature-Pressure Chamber....Apr.—30
Thermo King Circulation of Air....Oct.—30
Unit....Nov.—33
Trail-Aire Circulation of Air....Oct.—30
Unit Arrangement....Oct.—32
Trailer Truck interior and exterior....Oct.—31
Transport Truck Displaying Thermal unit..Oct.—29
20th Century Refrigeration Co. Display...July—34

U

Utilities Engineering Institute Shop....Feb.—78

V

Velometer....Oct.—45
Virginia Smelting Co. Conference....Mar.—80

W

Western and Pacific Coast Wholesalers...Aug.—80
Williams & Co., Toledo Branch....July—84
Wright, Ed., Place of Business....Nov.—54

Y

York Institute Graduating Class....May—46

Z

Zero Cold Frozen Food Pantry....Sept.—38
Zero Testing in Kramer Laboratory....Aug.—82

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Index to Advertisers

A-Abco Refrigeration Service 86
Acme Control Service 81
Acme Products Co. 87
Aerovox Corp. 65
Airco Refrigeration Parts 87
Aircraft Service Co. 59
Airo Supply Co. 86
Alco Valve Co. 28
Alter Co., The Harry 84
Ansul Chemical Co. 1
Audel, Publishers 79
Auto-Diesel Piston Ring Co., The 84
Automatic Heating & Cooling Supply Co. 83
Automatic Products Co. ..... 48 and 49

Bacharach Industrial Instrument Co. 83
Betz Corp. 12
Black, Sivalls & Bryson, Inc. 75
Blythe Co., H. W. 86
Bonney Forge & Tool Works ..... Back Cover
Boston Technical Institute 81
Brunner Manufacturing Co. 18

Chase Refrigeration Supply Co. 73
Chicago Seal Co. ..... Inside Front Cover
Chicago-Wilcox Manufacturing Co. 84
Circle Valve Repair 85
Commercial Trades Institute ..... 84 and 86
Cutler Hammer, Inc. 10

Davison Chemical Corp. ..... Inside Back Cover
Day & Night Mfg. Co. (Refrigeration Div.) 77
Detroit Lubricator Co. ..... 2 and 3

Edison Cooling Corp. 85
Electrimatic 16

Flow Controls, Inc. 82

G & E Equipment Supply Co. 85
General Controls 24
G. K. Refrigeration Co. 84

Hasco, Inc. 82
Heat-X-Changer Co., Inc. 71
Henry Valve Co. 25
Highside Chemicals Co. 11

Ideal Industries, Inc. 69
Imperial Brass Mfg. Co. 7

Jamison Cold Storage Door Co. 96
Jarrow Products 77

Kelvinator (Div. of Nash-Kelvinator Corp.) 15
Kerotest Manufacturing Co. 14
Keystone Engineering Corp. 82
Kinetic Chemicals, Inc. 55
Kold-Hold Manufacturing Co. 57
Kramer Co., Fred C. 81
Kramer-Trenton Co. 61

Logan Engineering Co. 53
Lynch Mfg. Corp. 17

McIntire Connector Co. 20
Mills Industries, Incorporated 9
Minneapolis-Honeywell Regulator Co. 21
Modern Design Products Co. 61
Modern Gas Co., Inc. 67
Modern Technical Book Co. 85
Mueller Brass Co. ..... 4 and 5

New Duty 82

Paragon Electric Co. 63
Peerless of America, Inc. 13

Ranco, Inc. 26
Refrigeration Control Service 63
Refrigeration Service, Inc. 87
Rempe Co. 71
Republic Electric Co. 83
Robco Corp. 85

Sanitary Refrigerator Co. 69
Sealed Unit Parts Co. 75
Servel, Inc. 86
Service Parts Co. 79
Shank Co., Cyrus 81
Skasol Corp. 23
Standard Refrigeration Co. 51
Stangard Dickerson Corp., The 83
Superior Valve & Fittings Co. 67
Supreme Mfg. Co. 83

Temprite Products Corp. 19
Tenney Engineering Co. 8
Thermal Co., Inc. 79
Tinit Mfg. Co. 87

United Speedometer Repair Co. 82
Utilities Engineering Institute 65
Utility Thermostat Co. 81

Virginia Smelting Co. 6

Wagner Electric Corp. 22
Wagner Products Co. 73
Western Thermal Equipment Co. 63
White-Rodgers Electric Co. 30
Wholesale Refrigeration Repair Co. 83
Wilson Refrigeration, Inc. 79

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